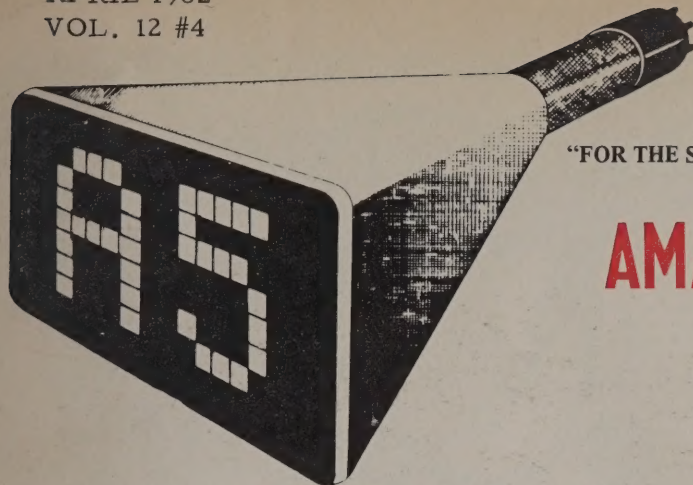


APRIL 1982
VOL. 12 #4



Our 15th Year

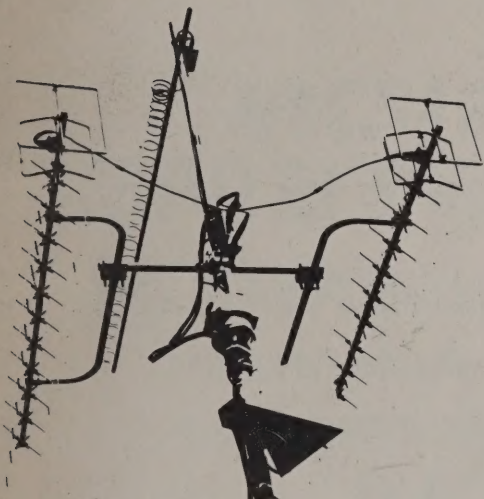
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AMATEUR TELEVISION MAGAZINE

PUBLISHED MONTHLY

FSTV ANTENNA SPECIAL ISSUE!

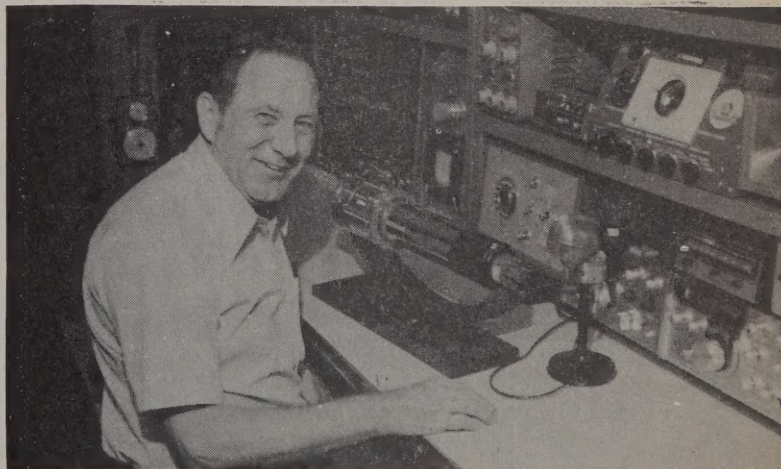


W6ORG ATV System



Digital SSTV by Jim Schueckler

- FSTV "Hints for the newcomer"
- New ATV-DX Column!
- SCAL ATV Net Results
- 48 element J-Beam Antenna
- UHF-ATV Yagis Antenna
- New ATV Book Information!
- AQ-4 FSTV Portable Antenna
- Dayton Hamvention Information!
- 1296-LY Loop Yagi Antenna
- TEM Microwave Antenna Systems
- Winegard UHF-TV Monitor Antenna
- CBG-3 Color/Pattern Generator
- Amateur Satellites and ATV
- TVRO Part 2 by WA6RDA
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In Review

The 40 meter FSTV Net conducted by W9ZIH Ron Stephanskie near Chicago on Saturday mornings (1700 GMT) is going quite well with nearly 20 "check-ins" throughout the mid west states with some even beginning DX scheduling as the spring-summer season rapidly approaches. With this issue, we introduce a regular DX ATV column reporting all known schedules, techniques and successful contacts achieved. No matter what part of the country you are in, we encourage you to get some local activity generated for ATV DX'ing and be sure and drop us a note about your accomplishments. This issue, as I promised, is a FSTV antenna special issue. You ole' timers will see nothing new but for the "newcomers" this should be a very informative issue. For those skeptics still at unrest out there about my devotion to FSTV, you'll see once again over half of this issue (22 pages) devoted to FSTV with another 13 pages on other modes of ATV. The May (Dayton) issue will be our best yet with full-color cover and ads and loads of great articles! Keep sending those articles and pictures, too. We started working the hamfest circuits beginning with Wheaton, Illinois (although we had to settle for a flea market position) and are planning on a booth at Davenport, Sterling-Rock Falls, Madison, Dayton, Dekalb, Sante Fe (Chicago), Indianapolis, Cedar Rapids (National ARRL), Des Moines, Kansas City and Peoria. I am even tempted to throw the rig, wife and kids (in that order) in the LTD and head for Knoxville, Tenn. for their hamfest and also take in the 1982 "World's Fair"! Please stop by our booth and say hello, okay? If W6ORGy would pay my plane fare to the west coast, I might come out there and even let ole' Bob N6AZV take a pot shot at me? (West coast joke). On the serious side, I was very disappointed February 22nd on twenty meters SSTV when well-intentioned Advanced Class SSTV'ers came up to the now legal (SSTV) General band and began running SSTV on the bottom end of the band (14.280 Mhz.) right on top of DX alley and established Net activity. A5 ATV Magazine announced in the January issue it's findings of a long and exhaustive study of bands, networks, specialty groups, etc. to best recommend a favorable placement of calling and operating frequencies for SSTV in the General bands, (also see March issue 82). Unfortunately, the 14.340 Mhz. recommended frequency is too high for the Advanced Class license operators that suffer high SWR and SSTV activity followed for the remainder of the 1st week divided between the two frequencies. I am not going to rehash all of the findings that have been published in previous issues (some as far back as 1980) as to what was actually done to arrive at the suggested frequency such as reader surveys, network listings, on-the-air monitoring and many hours of phone calls and correspondence to those who we value opinions. It boils down to this; Henry Ruh and A5 ATV Magazine got the proposal through the FCC and I suggest that our guidelines be followed against the "selfishness" of others who don't know what a tuner is. Morning and nightly activity can be heard within the top ten hz. of each band especially at the 14.340 and 7.290 Mhz. frequencies. We have done our best to recommend and it is now up to the General SSTV'ers to get in there and make it work! Good luck! (General SSTV Net on Sundays 1800Z on 14.340 Mhz.) (7.290 Sundays 1600 Z)

We are looking forward to seeing you all at Dayton and elsewhere, keep all those cards and letters coming! (Sam leave enough room in the trunk of the car for a "case of COORS".

DE WB0QCD



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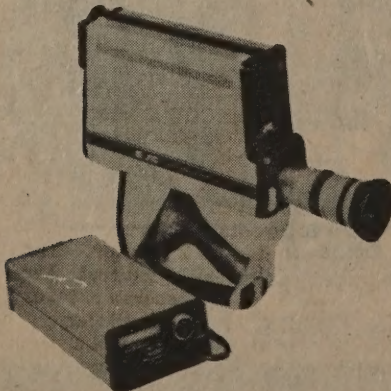
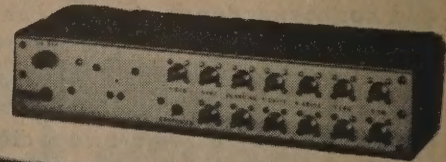
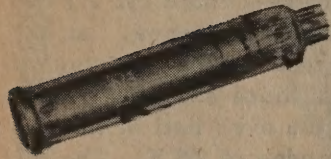
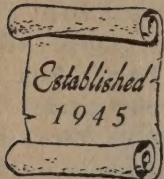
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14,330 and 7,265 Mhz. be used for General SSTV. Dave K4TWJ suggested that this matter be discussed at the Friday night session at the Dayton Hamvention. Personally, I prefer to keep our established frequencies that we fought for in the DX areas of the bands, especially on 20 meters. A General SSTV Net needs to be quickly established as soon as the FCC gives the starting date of operation. We rattled "the cage", keep up the good work at A5!" Brooks Kendall W1JKE, Saugus, Massachusetts EDITOR: Thanks Brooks for your "rattling the cage" on 20 meters! You do a fine job on the SSTV Net and it is always a pleasure "watching" the video that comes from it. It is unfortunate, that all SSTV'ers can't join in person, but I guess that will never happen with the different "classes" of licenses, etc. The FCC announced February 22nd as the "starting date" for Generals to operate in their allotted phone portions of each band and as described in the lengthy two-page discussion back in the March 82 issue, A5 Magazine is recommending the "top ten hz." segments such as 3,990, 7,290, 14,340 and 21,440 Mhz. for General SSTV operation. This is recommended after careful study of existing traffic and Nets within each band. It is felt that the "top end" segment is the area of least resistance and will become eventually a "protected" segment due to the band edges. A Sunday SSTV is being formed and as soon as times and Net Control stations are assembled it will begin. Personally, I would like to see the 15 and 40 meter bands utilized heavier. The already established 7,290 Mhz. FSTV Net which meets on Saturdays at 1700 GMT by W9ZIH near Chicago is a great way to grab ahold of the frequency and SSTV operation should resume immediately after that Net. Whatever is decided by "all" operators, we owe a great deal of thanks to Henry B. Ruh (A5 ATV Magazine owner and promoter) KB9FO and Robert Rochrig (FAX) for getting the approval of Docket 80-252 passed by the FCC. Thanks Brooks!

"The Mount Beacon Amateur Radio Club" of Beacon, New York (65 miles north of NYC) is presently working on an ATV repeater. It should be on the air just after January 1982 at 439.25 input and 426.25 output using vertical polarization. I am also interested in forming an East Coast FSTV Net on the HF bands to coordinate UHF schedules and exchange of ATV information. If anyone else in the east would like to get a "net" going, please drop me a line." Jim Capicotto WB2WLN, 75 Coach Lane, Newburgh, New York 12550. EDITOR: 7,290 Mhz. would be ideal Jim as the "Midwest FSTV Net" has found out. Maybe Saturday afternoon following the "midwest" net? Let us know what you get going, Jim!

"Thanks for the sample copy of ATV Magazine! I sure enjoy reading them from cover to cover. I use to take QST, CQ, HAM RADIO and Popular Electronics but never read much of them. A5 Magazine has much more interest for me. W9LII and myself are just getting going on FSTV in the Peoria, Ill. area and hopefully will generate some interest. We are looking forward to seeing A5 Magazine again this year at the Peoria SUPERFEST and will have some ATV interest and activity going for you!" Pat Pratt K9ILA, Pekin, Illinois

"I am an ARRL Life-member. I live in the Central Division. I did not get a recall election ballot. Come on Harry, can't you run an honest election?" Henry Ruh KB9FO, Des Plaines, Illinois

"One criticism of A5 Magazine is that the presentation of circuit diagrams with article projects is not the best and often mistakes can be made from them. It lessens the desire and confidence to attempt building projects in your magazine. The magazine serves a very useful role in the development of ATV and my best wishes to you in 1982." Norrie GM4BVU, Lanarkshire, Scotland EDITOR: Thanks for the comments, you are not the first to complain about that. Part of the problem is with the newsprint type paper that we use (to keep costs down) and also we are at the liberty of the contributing authors. We try to "go over" the penciled drawings as best we can. We shall improve on this in future issues! Thanks Norrie.

ASSEMBLY OF AN AMATEUR TELEVISION FSTV RECEIVING SYSTEM

A Continuing Series of Articles to Aid the Newcomer to ATV

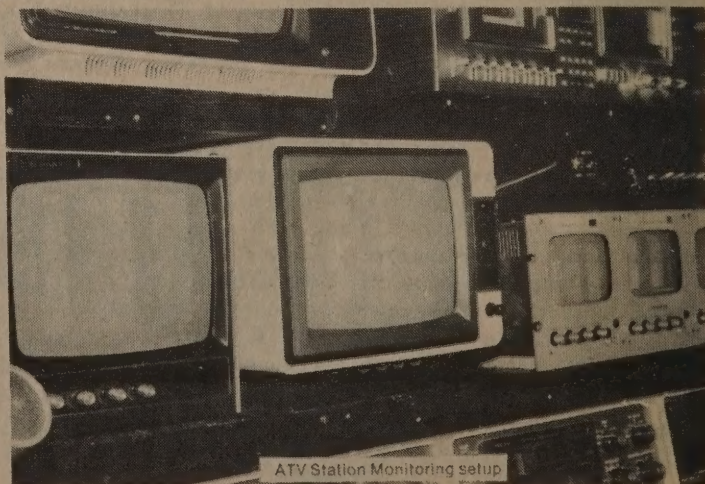
Beginning with the January 1982 issue, we started a series of articles designed to aid the newcomer interested in Amateur Television to get on-the-air the fastest and most economical way possible and to take advantage of all that has been learned throughout the years by those before him. January's issue gave a simple basic description article by Tom O'hara W6ORG on "How to get started on ATV" including a component block diagram of equipment needed. The March issue had an article on how to get FSTV activity and interest going in your local area entitled "No ATV in your Area? That's Your Fault". With this issue-we shall briefly discuss putting together the ATV "receive system", and with the ATV Antenna Special Issue articles-the beginning ATV'er should be getting a pretty good idea just what Amateur Television is all about.

Choosing an Amateur Television Downconverter

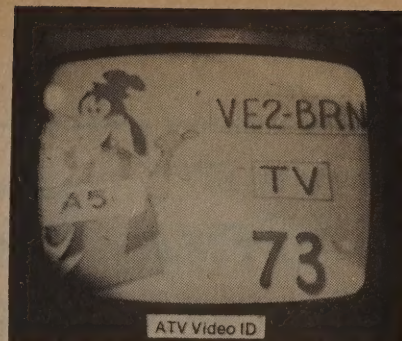
It must be noted, that ATV signals in the 420-440 Mhz. range can indeed be "picked up" by modification or "padding down" a UHF-TV tuner section of a normal commercial TV set. But, one of the important lessons learned with this method is that without a tremendous amount of preamplification in sensitivity ahead of the circuit the basic TV set is a very poor low-gain receiver designed to work in the local viewing area (usually up to 50 miles) receiving hundreds of thousands of RF wattage that is outputted by the television transmitter facility. Also, the TV set becomes unuseable for regular TV programming due to the frequency modifications. The use of ATV Downconverters is most popular with low noise high-gain transistor circuits that give the ATV operator and his chosen TV set the best video and sound signal possible. There are several sources of ATV Downconverters around the country as careful study of the advertising pages will reveal. There are three important things to look for in obtaining a downconverter initially; 1. A quality built, stable and smooth tuning system. 2. A circuit with good sensitivity gain. and 3. a system that can be interfaced to additional video gear later on. Any of the units advertised in ATV Magazine are known quality products with many of the systems tested and reviewed in earlier issues (obtain A5 Master Article listing \$1.00 WBØESF). The Downconverter merely changes the frequency of selected channels 2-4 that the TV receive stages see making a tunable 420-250 Mhz. tuner for the AM video pictures and FM sound carrier. Simple interfacing using a commonly found 75 ohm to 300 ohm balun (the TV likes 300 ohms) to the antenna terminal screws or direct tuner connection is all that is required to the TV set. Plug in the ATV antenna and you are ready to receive FSTV!

Selecting a TV Set for Fast Scan Television

Probably the most overlooked and neglected item in the ATV shack is the TV set itself. All the pre-amplifiers, hardline coaxial cable, high-gain antennas and "up band conditions" in the world will not help a "tired" TV set used for received. The TV set is your "receiver"! How can you justify an elaborate ATV system if your basic receiver is sick? It is very easy to settle for that "extra" TV set in the den or upstairs in the "kids room" or that "junked out" TV set from that friend of yours doesn't use very much. Even use of the older tube-type TV sets cannot bring the results that the hotter transistorized sets are bringing. Real bargains can be obtained on very sensitive TV sets with AC/DC voltage combinations (preferred because of the isolation transformer and the protection against a "hot" chassis that could blow the ATV equipment circuits & possibly even electrocution to the



operator) at chain drug-stores or discount houses for \$50-90.00 on special "sales" used as loss leaders by retailers. There are many Japanese unfamiliar brand labels such as Samsung, Midland Sanyo, Gold Star etc. that have very good "front ends" for receive. Also keep in mind, that even several of the same types of TV's can perform differently. I purchased two Zenith 12 inch models on sale one time from a drug-store and one tested out "hotter" than the other. Later on, I found that the TV set in the XYL's kitchen was the "hottest" set in the house and an actual P1 to P2 image improvement could be seen from a live 439 Mhz. signal. So, what we are saying is to shop around for TV sets or experiment in the "shack" with different models. Get together with the



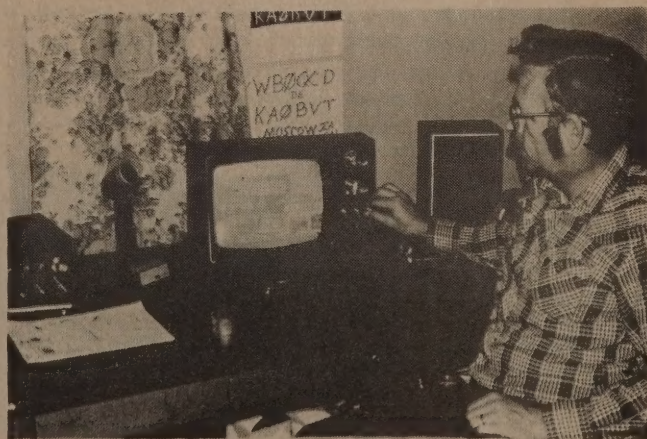
buddy on ATV with you and compare your sets, you will be amazed at the difference! The TV set is probably the one item that you can keep experimenting with from time to time to achieve the absolute "maximum" reception from you Amateur Television system. Another way to improve your reception is to have the TV set used repeaked and aligned. Unless you know how to do this yourself, it might be very helpful to have the local TV store align the receiver and stress to them how important the sensitivity and low-noise figures are to you for what you are doing. An article will follow shortly on how to properly align the TV set for maximum gain.

Selecting the Amateur Television Feed Line & Antennas

An article is being worked on showing the different loss ratios of various types of coaxial cable commonly used for ATV. In short, don't settle for anything less than BELDEN 8214 coaxial cable. This type of cable is currently selling for around 36¢ a foot at local Amateur Centers and is 97% shielded polyethylene with a loss figure of 3.8 db per 100 foot at 400 Mhz. Runs over 75 feet become quite lossy and eventually hardline or heliaxial cable should be installed for the "serious" operator. My recent installation of "Andrews 7/8 inch ripple-shell, hollow copper center conductor hardline (75') tested 38 watts at the end of the run with 40 watts applied into the BIRD wattmeter at the transmitter which was far better than a previous reading of 23 watts on 8214. The old saying "what goes up must come down" is hopefully not true when talking about vswr but is certainly true when talking about the additional loss of received signals from lossy lines. The gain of the hardlines installation did much better than a series of preamps or amplifiers. Several types of antennas are shown within this issue that will work well for Amateur Television. Personally, I prefer to purchase the English made and popular "J-Beam" antennas. The 48-element model has very high true-gain figures, is very broad banded (I measured from 426-440 Mhz. under a 2-1 vswr) and is well built to withstand high winds & ice and relatively small in size. Other good ATV antennas are KLM-27 element models and other type yagis and quaqis. Many "homebrew" designs end up working very well after modifications to ensure broadbandedness. It is important that an antenna be broadbanded for ATV work as the sync tips and color/sound information is far away from the video carrier center frequency being used. A beam may check low vswr at 439.25 Mhz. but may be terrible at 443.75 Mhz. or further when run-actual video signals (which is hard to actually measure). The surest way to obtain a good working ATV antenna system is to look around & see what others are running and are working on ATV-DX. The fellas that constantly work hundreds of miles must have some thing right?

Newcomers or old-timers, be sure not to miss the Saturday ATV Nets on 7.290 Mhz at 1700 GMT. Get your ATV "buddy" and start experimenting. You'll make alot of mistakes and shortcuts before obtaining a reliable working ATV system. But, hang in there-as there is no greater thrill in all of Ham Radio than "seeing" those video pictures come into your "shack" LIVE!

WB0QCD



ATV from Moscow? (Iowa) KA0BVT Don Hartman

Fast Scan ATV

video

A5 Amateur Television Magazine

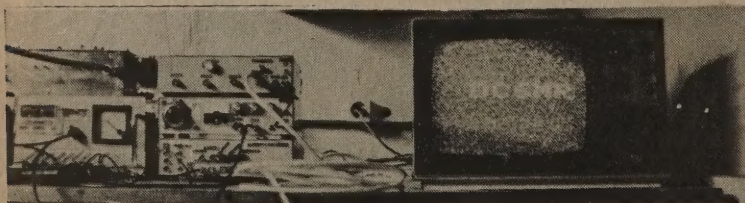
DX Propagation-Nets-Operating Schedule Information



W9ZIH CHICAGO POWERS ATV INTO IOWA-SEEN FEBRUARY 15TH

The 40 Meter ATV Net has returned to the airwaves on Saturday mornings at 1700 GMT (12 noon EST and 11 am. CST) on 7.290 Mhz. in the General phone segment conducted by Ron Stephanskie, W9ZIH located near Chicago, Illinois. The "net" is for the useful exchange of ATV information such as equipment that is available, antennas, amplifiers, preamps, feed line loss, TV sets, videorecorders, cameras, audio carriers, video switchers and generators, etc. and

for the establishment of ATV-DX UHF operating schedules utilizing other band modes such as two-meter FM/SSB, 220 Mhz. or 432-444 Mhz. audio/video monitoring. All interested ATV stations are welcome especially SSTV'ers who are the prime prospects for FSTV operation. The "net" encourages during the week schedules, Wednesday night local FSTV meetings and "on-the-air" tests during the Saturday net. Many stations in the midwest are now monitoring 7.290 Mhz. regularly. On the January 16th net, WB0QCD's 439.25 Mhz. video carrier was heard by K9KK Rick near the Chicago area nearly 200 miles away in the "dead" of winter propagation. Iowa will undoubtedly be worked on FSTV this summer's openings with over a dozen stations active, most with horizontal polarization. ATV Stations on the West Coast recently reported seeing video from a MM/7 over 400 miles into a local repeater and Chicago enthusiasts have commonly seen signals from Indiana, Ohio and even openings into Pennsylvania and New York! The "key" to ATV-DX'ing is knowing when the band is open and to ensure proper "watch patterns" and schedules. Monitoring of UHF-TV stations in the 500 Mhz. bands is an excellent key to propagation conditions as is the listening to scanner frequencies of fire, police and business FM bands. Often, two-meter repeaters and simplex transmissions can be monitored to see whether or not the band is up including programming a 439.25 Mhz./443.74 Mhz. (or whatever frequencies are used by transmitting stations) frequency to look or "hear" video-carriers or audio on-carrier or sub-carrier signals. 7.290 Mhz. can be utilized to coordinate these activities if other VHF/UHF frequencies cannot be monitored. One of the most important requirements in success of ATV-DX'ing is the subject video signal being sent. "Shack" pictures of small detailed signboards will not "pop" through the noise levels on marginal conditions. Large letters, preferably white on black backgrounds with callsign and location information, drive the most average wattage from the transmitter to the antenna system. Studies have shown many times that a white lettered sign on black backgrounds comes through better than the reverse. Get those exciters peaked up, preamps in line, feed lines checked and antenna systems tuned and join in the 40 Meter ATV Network activities and "see" you on FSTV! All ATV'ers are encouraged to send in their DX reports and operating schedules and test transmission details. An unexpected "winter" band opening on UHF frequencies January 18th was taken advantage of by N9GA Gary in Canton, Illinois, WB0QCD in Iowa, WB9MCF Ron in Burnside, Illinois, W4MJT/9 Carl near Canton, Illinois and WB0ZJP Dave Williams of St. Louis, Missouri. Contacts of P-2 to P-4 copies were made for over four hours at distances greater than 130 miles on average 50 watts. The 200 plus mile barrier was broken west of Chicago as W9ZIH was monitored in Iowa by Mike WB0QCD for the first time on February 15th (running morning schedules) with up to P3 quality & 439.25 Mhz. on-carrier audio/144.34 Mhz. (Duplex) voice communications! Send ATV reports!



FIRST ATV COMMUNICATION?

☐ We claim to have carried on the first live two-way amateur television communication on June 5, 1954, with TV cameras and transmitters of our own design and construction. Are there any challengers? — John C. Davis, W4ATO and Asa F. Tift, W4PGK, Albany Georgia

West German FSTV DX "popping" thru the noise and W6ORG ID

OST.

SO. CALIF. ATV NET CHECKINS:

WA6BHF	Don Westchester	5-watts	Helix Antenna	01/11/82 & 01/18/82
WA6ZMI	Lee Westminster	7-watts	48 Ele. J Beam	1/11/82 & 1/18/82
WA6ZVE	Dave Chatsworth	8-watts	48 Ele. J Beam	----- 1/18/82
WA6CAS	John La Verne	10-watt	DX-420	-----
WA6MVD	Diane Sunnymead	30-watt	15 Ele. Quagis	1/11/82 1/18/82
WA6PFA	Tom Placentia	10-watt	DX-420	1/11/82 1/18/82
WA6KIN	Jerry Otay Mesa	10-watt	DX-420	-----
WA6UAH	Pat San Diego	70-watt	Duo 11 ele.	1/11/82 -----
WB6ROP	Jim San Diego	70-watt	Duo 11 Ele.	1/11/82 -----
W6ORG	Tom Arcadia	10-watt	48 Ele J. Beam	1/11/82 -----
KA6HXX	John Simi Valley	5-watt	48 Ele. J. Beam	1/11/82 1/18/82
WD6BZN	Joan Simi Valley	5-watt	48 Ele. J. Beam	1/11/82 1/18/82
KA6NAT	Marcel Santa Mon.	7-watt	DX-420	1/11/82 1/18/82
W6VCF	Ron Encino	5-watt	48 Ele. J. Beam	1/11/82 -----
W6RVP	John W. L.A.	10-watt	Quagie	----- 1/18/82
WB6ZPN	John L.A.	10-watt	11 Ele.	1/11/82 1/18/82
WB6YAU	Jack Simi Valley	5-watt	48 Ele. J. Beam	----- 1/18/82
W6QDP	Dave Pico Rivera	100-watt	16 Ele. Col.	1/11/82 -----
W6YFT	Dale Flintridge	10-watt	88 Ele. Col.	1/11/82 -----
K6ZSR	Mike La Cernica	4-watt	48 Ele. J. Beam	----- 1/18/82
K6YGX	Austin Northridge	6-watt	32 Ele. Col.	1/11/82 1/18/82
K6KMN	Doug Mt. Wilson	20-watt	16 Ele. Col.	1/11/82 1/18/82
WA6SVT	Mike Costa Mesa	10-watt	15 Ele.	----- 1/18/82
WB6LQP	Phil San Gabriel	10-watt	15 Ele.	1/11/82 1/18/82
N6DOW	Dick Sunnymead	30-watt	15 Ele. Quagis	1/11/82 1/18/82
W6MEB	Harold Torrance	5-watt	48 Ele. J. Beam	1/11/82 1/18/82
K06E	Merv Pacific Pal.	10-watt	24 Ele.	----- 1/18/82
W6SFI	Steve Hollywood	40-watt	Duo Quagi	----- 1/18/82
N6ZT	Rick Simi Valley	10-watt	48 Ele. J. Beam	----- 1/18/82
WA6QVJ	Merv Hollywood	6-watts	16 Ele. Col.	----- 1/18/82
WB6CGN	Jack Fontana	6-watts	16 Ele. Col.	----- 1/18/82
WB6UJY	Thad Supuliva	10-watt	16 Ele. Col.	----- 1/18/82
K6KDO	John Yuciapa	10-watt	14 Ele. KLM	----- 1/18/82
WB6NCF	Bob Santa Mon.	10-watt	48 Ele. J. Beam	----- 1/18/82

THE TOTAL FOR 1/11/82 MONDAY NIGHT NET WAS: 19.

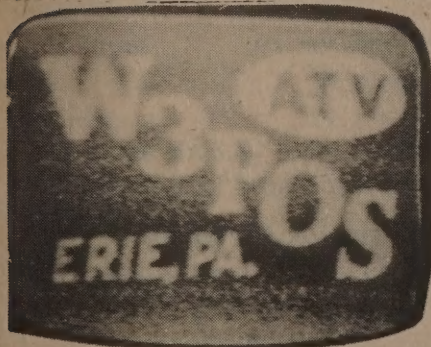
THE TOTAL FOR 1/18/82 MONDAY NIGHT NET WAS: 26.

NOW THAT'S AN ATV NET! Thanks Southern California Newsletter and WA6MVD.

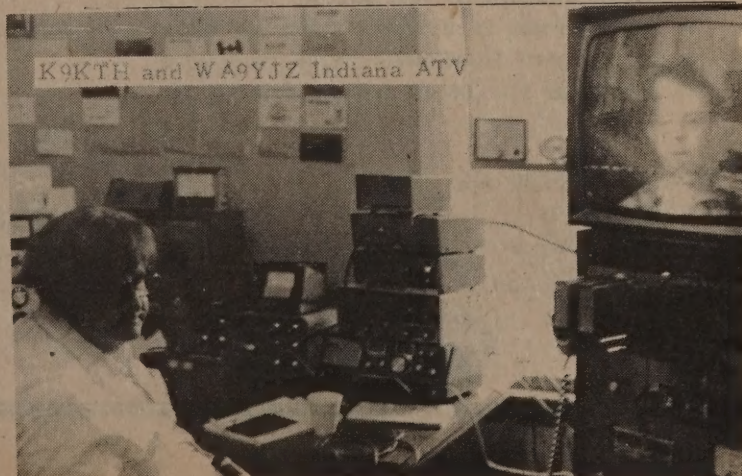
Amateur Television



The MIDWEST'S SYNC-BUZZ ATV NEWSLETTER is published quarterly in the months of January-April-July & October. The newsletter covers FSTV activity Minnesota, Michigan, Ohio, Indiana, Illinois, Missouri, Nebraska and Iowa. The publication is published by A5 ATV Magazine owner WB0QCD and can be subscribed to for \$1.00 per year and four 20¢ postage stamps (no SASE's). For the January issue, send a couple 20¢ stamps-PO Box H, Lowden, Iowa 52255-0408. If your an ATV DX'er and live in the "midwest" you'll want this newsletter!



Look for ATV DX'er W3POS Ed Gubish on "openings" this season! Ed has been worked in Chicago regularly! Photo by WA9EUN Dwight Raddat



DC-1 UHF CONVERTOR FROM

FEATURES:



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SE-1a UHF ATV TRANSCEIVER

NOW AVAILABLE WITH DC-1 RECEIVER CONVERTOR

FEATURES:

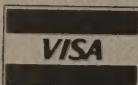
- 6 - 8 WATTS AVERAGE VIDEO RF OUTPUT.
- 2 RF STAGE DC-1 TUNER OUTPUTS TO TV CHANNEL 2-4 (specify).
- ILLUMINATED METER SHOWS TRANSMIT AMP CURRENT AND RELATIVE RECEIVE FREQ.
- CRYSTAL CONTROLLED TRANSMIT ON 439.25MHZ (OTHER FREQ. AVAILABLE).
- RECEIVER IS TUNEABLE FOR 18MHZ OF THE 420-450MHZ BAND.
- STRIPLINE LINEAR FINAL WITH RUGGED MRF641 TRANSISTOR.
- AMPLE BANDWIDTH FOR COLOR.
- FRONT PANEL SELECTABLE TRANSMIT AUDIO - 4.5MHZ SUBCARRIER OR FM.
- SOLID STATE TRANSMIT/RECEIVE SWITCHING.
- ALUMINUM ENCLOSURE WITH EPOXY FINISH.
- 10.8" x 6.2" x 2.5".

\$374.95 plus \$4.50 UPS.

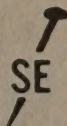
OPTIONS:

- SA-1 SYNC AMP ADD \$16.00.

Florida residents Add 4% Tax.



Add a camera, antenna, mic, 13.6vdc and a TV set for a complete fast scan ATV station.



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(5-9:30 PM our time)

J Beam MBM48/70cm Antenna

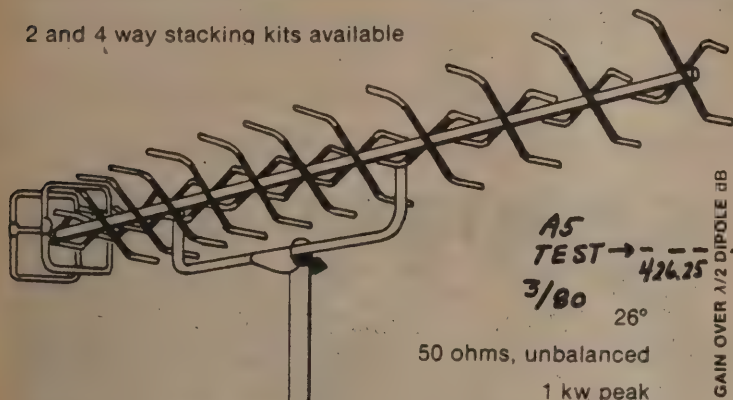
420-450 MHz

MBM 48 ELEMENT 70 CM UHF "J-BEAM" ATV ANTENNA

15.7 db (dipole reference)

Manufactured in England, imported to the states, the "J-Beam" UHF antenna is but one of several systems designed for wideband 70 cm. use. Upon recommendation by Tom W6ORG of PC Electronics, I built a 96 element system--using two antennas with co-phasing (harness available) with 4' 9" spacing (48 inch recommended). After six months of fighting with various types of cables for my feed line (including a run of hardline with flexible RG8U on both ends and connectors that always showed bad VSWR), I decided to use a new piece of quality BELDEN 8214 RG8U type coax. The following results were obtained (using BIRD wattmeter 200-500 Mhz. slug at transmitter). The "J-Beam MBM 48/70 CM" antenna has about a 15-20 degree beamwidth (stacked array) on weak signals. The gain is so great that it becomes a "razor sharp" beam perhaps not desirable by those looking for broadness. Demonstrating almost 20 Mhz. bandwidth under 2-1 SWR--the system is ideal for ATV operation, excellent for 432 SSB activity but too narrow for OSCAR Satellites. The six-foot length of the boom takes up less space than other antennas with nearly the same gain figures. (An 88 element model with yet higher gain is available) It must be pointed out that each arm of the crossed elements represents 4 elements and each section of elements must be mounted exactly as pictured. When using phasing harnesses, the direction of the entering feed cable must flow the same direction to both antennas (not specified in instructions). Two antennas should show a very respected 18.7 dbd gain figure. My 8 watt video signal modulated is now being seen regularly with P4 quality some 41 miles away at 439.25 Mhz. simplex. The beams can be obtained from Spectrum International or PC Electronics for around \$70.00 each. WBOQCD

2 and 4 way stacking kits available



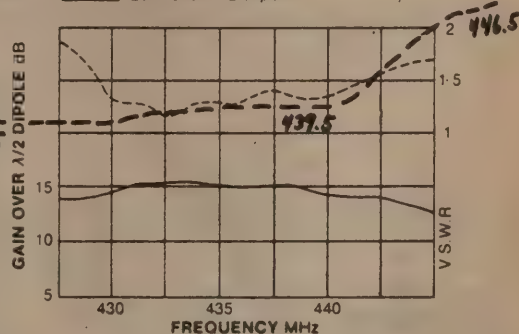
length-72 in., width-18 in., height-14 in. with mtg. bar
weight-6 lbs., wind load @ 100 mph-38 lbs.

50 ohms, unbalanced

1 kw peak

KEY

----- V.S.W.R.
—— Gain over $\lambda/2$ Dipole



426.25 Mhz. 1.3-1 SWR

439.25 Mhz. 1.4-1 SWR

446.50 Mhz. 2.2-1 SWR

(There is also an 88-element model available rated at 18.5 db gain 92 inches long)

Stacking Data: (maximum distance)

Hor., Boom to Boom 48 ins

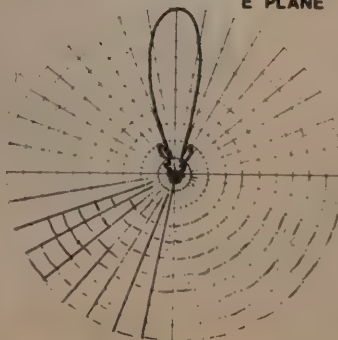
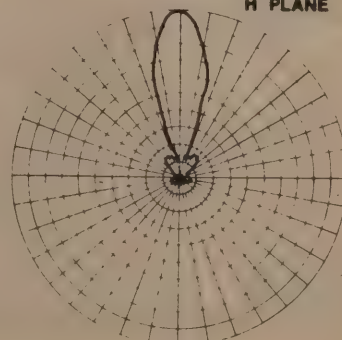
Vert., Boom to Boom 48 ins

Electrical Data:

Power Rating 1 KW
Coaxial Feed 50 ohms
Balanced Feed 200 ohms

Mechanical Data:

Length 72 ins
Width 18 ins
Height 8 ins
incl. mounting bar 14 ins
Weight 6 lbs
Wind Load (100 mph) 38 lbs

POLAR DIAGRAM
E PLANEPOLAR DIAGRAM
H PLANE

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Prevent OSCAR 8 Mode J desense
 Use MMF200-7 \$42.95
 Stop receiver IMD birdies
 Use PSF432 \$59.95

ANTENNAS

420-450 MHz J-beams
 48 el. 15.7 dBd \$75.75
 88 el. 18.5 dBd \$105.50

1250-1300 MHz loop yagi 1296-LY \$49.75

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Amplifiers**

FM - 558 - CW	80 W. in	80 W. out	\$179.95
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8123 2 W. in	30 W. out	89.95	

These amplifiers, except 8123, have built in KA pre-amps. The 8109 and 81016 may be used with A1's or Transceivers. They will key with T. Watt input.

RC - I Remote Control

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Amplifier**

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10 W. in	100 W. out	2 W. in	25 W. out
			\$319.95

USING YAGIS ANTENNAS

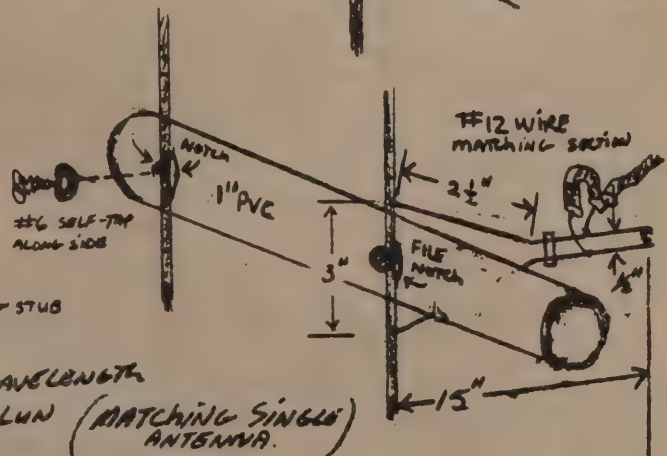
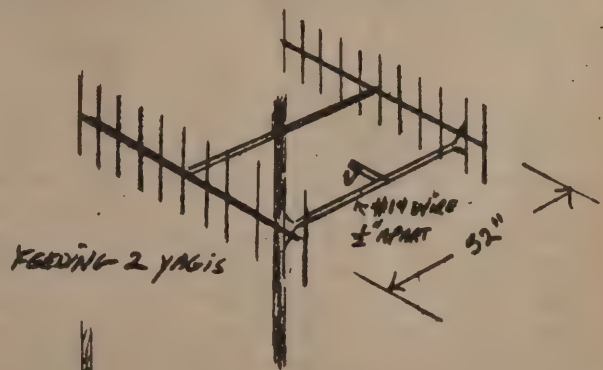
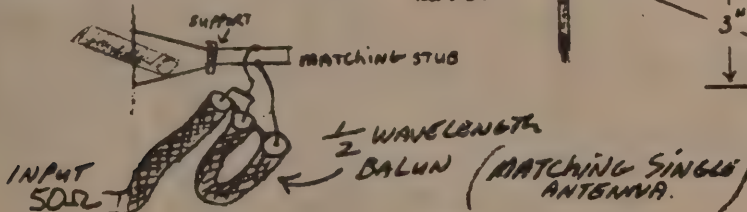
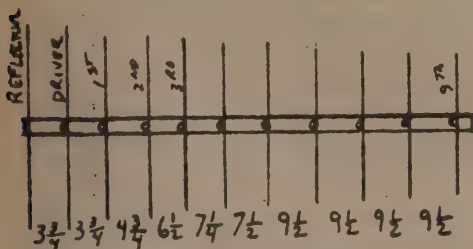
FOR AMATEUR TELEVISION

BY WA6RDA

High gain antennas are almost a necessity for Amateur Television operation. The physical size is small enough at 432 Mhz. to enable a multiple element array to stem from a small inexpensive rotor. One of the possible drawbacks of using Yagis antennas for ATV is that the bandwidth might be too narrow thereby "chopping-off" the audio and color subcarrier & possibly the sync tips that ride up to 4.5 Mhz. above the video carrier signal. This is why some stations with similar equipment "in the shack" obtain different results on the air. The audio sub-carrier is super-imposed nearly 30 db down from the main video carrier and the Yagis antenna design could very well roll-off several db 4-5 Mhz. above resonance which cuts down the distance workable for DX'ing. One method to overcome the narrow bandwidth problem is to stagger tune some of the antennas within the array achieving an overall flatness. Color ATV requires a 3.58 Mhz. "colorburst" signal accompanying the main carrier.

Most ATV in western states and elsewhere is done vertically polarized. Horizontally polarized ATV antennas (popular in midwestern and some eastern states) can be accomplished by simply turning the array 90 degrees upon mounting. Vertical operation is popular for repeater and mobile operation. Stacking yagis type antennas is quite simple and provides another 3 db of gain. Constructing an 11 element Yagi (designed for 434 Mhz.) can be started by using 1 inch sked 40 PVC pipe. The elements, which are laid into a "notch" filed by a rat-tailed file, are constructed out of 1/8 inch brass rod. The elements are secured by self-tapping set screws with a flat washer alongside. Remember when attaching a cross boom to find the balance point and then cut out a section equal to the T and glue in a threaded T that will accept 1/2 inch water pipe.

Reflector	13 and 1/4 inches
Driver	13 inches
Director	12 inches
#2	11 and 7/8 inches
#3	11 and 3/4 inches
#4	11 and 5/8 inches
#5	11 and 1/2 inches
#6	11 and 3/8 inches
#7	11 and 1/4 inches
#8	11 and 1/8 inches
#9	11 inches





AMATEUR TELEVISION MAGAZINE

OUR 15TH YEAR!

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A5 ATV Magazine can be purchased at the following retail outlets:

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Henry Radio, 11240 W. Olympic Blvd., Los Angeles, California 90064
Robot Research, 7591 West Convoy Court, San Diego, California 92111
Derrick Electronics, 714 West Kenosha, Broken Arrow, Oklahoma 74012
Amateur Radio Equipment Co., 1203 East Douglas, Wichita, Kansas 62711
ATV Research, 1300 N. Broadway, Dakota City, Nebraska 68731
Spectronics, 1009 Garfield, Oak Park, Illinois 60304
Amateur Electronics Supply, 4828 West Fond du Lac Avenue, Milwaukee, WI. 53216
Hoosier Electronics, 43B Meadows Shopping Center, Terra Haute, Indiana 47802
Silvernail Electronics, 14061 111th Terrace North, Largo, Florida 33540
Ray's Amateur Radio, 1590 US Highway 19 South, Clearwater, Florida 33516
Universal Amateur Radio Inc, 1280 Aida Drive, Reynoldsburg, Ohio 43068
Village Green Bookstore, 766 Monroe Avenue, Rochester, NY. 14607
Ham Radio World Inc, Oneida County Airport-Terminal Bldg, Oriskany, NY 13424
Science Workshop, PO Box 393, Bethpage, NY. 11714

Copies may also be obtained from A5 ATV Magazine "Foreign Reps." VE3BWW, VE6PW, DJ4GL, G8PTH, ZS6BTD, CE3AUL, ZL2FR and JA0BZC. Send \$2.50 (US) and large SASE.

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EVERYTHING YOU ALWAYS WANTED TO KNOW ABOUT ATV*

* but were afraid to ask

A 100 page-10 chapter, large 8 1/2" X 11" manual that covers every facet of Amateur Television! History, modes of operation, what you need to get started, commercial equipment directory, how to use ATV, choosing a TV set, video-theory, cameras, lenses, filters and lighting techniques, video switchers, buffers and ID'ers, setting up the TV studio, Audio sub-carriers, On-carrier audio for DX'ing, video tape recorder interfacing, portable and mobile ATV operation, ATV for special events, ATV DX'ing tips and Nets, downconverters, exciters, linear amplifiers and audio building projects, 1200 Mhz. linking and gear, sync-stretchers, RF sampling detectors, wattmeters for ATV, coaxial cable comparisons, interdigital filters, test equipment, signal report chart and a tear-out test pattern, ATV antennas, theory, polarization and stacking guidelines, antenna projects for the homebrewers, ATV repeaters, Clubs and organizations, How to build an ATV Repeater project, Advertising and a cumulative index of over 1,000 articles on ATV!

The most complete ATV book ever published! A must item for every ATV shack!

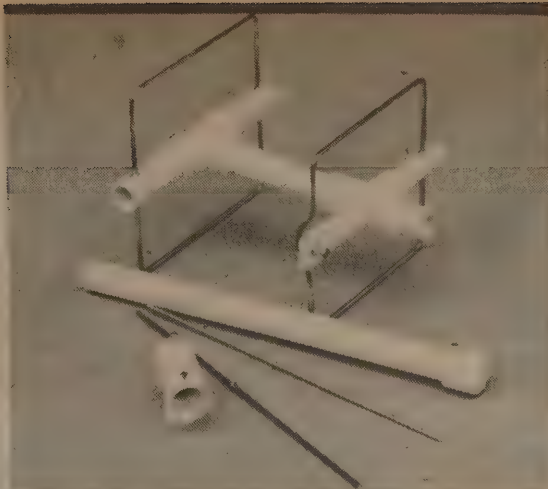
Only 1,000 will be printed! The first sales will be at the Dayton Hamvention in April 1982. All issues mailed will be wrapped in heavy protected envelopes. Anticipated deliveries in May 1982. Send \$9.95 plus \$2.50 postage and handling allowance to: (save postage and handling fees by pick up at Dayton)

A5 ATV MAGAZINE
P.O. BOX H, LOWDEN, IOWA 52255

AQ-4 QUAQI

PORTABLE ATV ANTENNA

The AQ-4 portable ATV antenna is designed to get ATV signals out of the shack and out into the open. This "take-a-part" A5 antenna is ideal for hamfest demonstrations or meetings, portable fixed operation or can be expanded into a full base station beam antenna. Common usage is with 100 mw. exciters, operating with 12 vdc cameras or higher-power portable TV arrangements utilizing battery packs, etc. Vertical or horizontal polarization is very easy to change by moving the T 90 degrees and relocking the set-screws. Initial setup will require a screwdriver, PVC glue and a 1/2" water pipe "stand" or mast hookup device. The center T is supplied with standard 1/2" threads but adaptors to the other types of masts can be fabricated. Careful alignment for best picture and lowest swr should be accomplished before doing any final gluing. The directors are the same length with several holes drilled for best bandwidth/gain settings. Also, the driver/reflector can be adjusted (spread) by up to 1/4" by not inserting the PVC pipe all the way in. Directors also can be adjusted by not inserting each section all the way in. You should decide whether or not you want to glue the directors permanently or have them so that you can take them out for disassembly, (Use 5 minute epoxy setup). Do not glue around the "T" center so that it can be disassembled or changed for polarization. Standard respect during swr tune-ups regarding surroundings of possible reflective material should always be maintained and understood. Use a weak ATV signal to align for the best reception. A minimum 12" PVC pipe is recommended for proper matching with added support of metal masting for longer arrays. Soft copper elements are used instead of brass or aluminum due to possible breakage when there is no soldering iron around to fix anything. If dropped, the soft copper elements can easily be bent back into position. Horizontal operation has the BNC connector at the top of the antenna for proper water drainage problems should they exist. Gain is somewhere between 4-6 db gain as reported by many users. Pattern measurements are not all that important for the primary purpose of this antenna with 7-8 foot height proving the best results. Using an unmodified camera tripod makes an excellent mast-pole base foundation. Extension of this design out to a 14 foot boom quaqi is easily done with required support of the boom assembly recommended. The design of the AQ-4 antenna is easily constructable by any homebrew ATV'er but I do have some finished models on hand for \$19.80 and please include \$3.00 for shipping. Save money and time and build it your self! See you on Amateur Television de WA6RDA Gerard Wilson

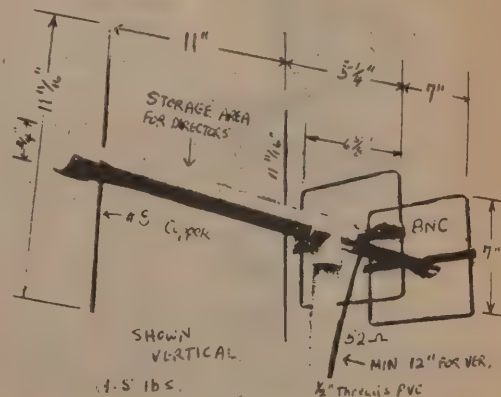


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- . AQ-4 QUAQI

434-440 Mhz. AQ-4 "Quaqi" Portable Antenna



4 Element Quaqi AQ-4
Portable, rugged, designed
to get ATV out of the shack!
#8 copper elements assure top
performance. Use with link-ups
or mini-cam operations. Only
1 1/2 pounds. 2 boom length. Yag
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element quad. Has BNC conn



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The NEW ATV Manual-**EVERYTHING YOU ALWAYS WANTED TO KNOW ABOUT ATV*** but were afraid to ask! will be on-sale for \$9.95 with only 1,000 copies printed on a "first come first serve" basis (mail orders will reserve you a copy to be mailed in May) PO Box H, Lowden, Iowa 52255
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UPCOMING ARTICLES IN THE MAY "DAYTON SPECIAL ISSUE":

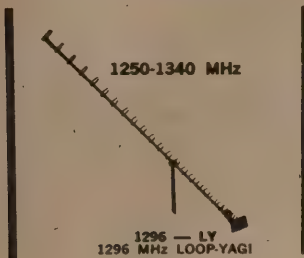
COLOR TV front cover, Chicago ATV Report, ATV Repeater Directory, FSTV Graphic Generator using SSTV equipment, TSQ-1 TV Squelch circuit, Color SSTV Equipment Comparisons, Color SSTV Operator Directory, Animated Motion SSTV, All the facts about FAX, RTTY with K0WVN and A5 ATV Magazine Cumulative Index of over 700 articles, projects, items!

1296-LY LOOP YAGIS ANTENNA

One of the most popular and versatile UHF antennas for Amateur Television work with high-gain is the 1296-LY Loop Yagi. The antenna is very broadband covering a frequency range of 1250-1340 Mhz. with rated gain equal to a 4 foot diameter dish antenna system at 20 db over isotropic claimed by the manufacturer. The beamwidth is about 20 degrees on E plane & 18 degrees of H plane and uses a type N feeding connector and 50 ohm impedance matching. The 92 inch boom length is adequate for lightweight mounting as shown on the front cover of W6ORG's antenna system. The individual loop diameter is 3 inches nominal with the overall antenna weight less than 1-1/2 pounds. Rated wind survival is 80 mph minimum. The antenna is horizontally polarized when the loops are mounted above or below the beam's boom mast. This antenna is ideal for ATV links, video-duplexing when tied in with 1296 varactor triplers and repeater remote receiving. The 1296-LY Loop Yagis can be "stacked" as detailed in the drawings below.

The 1296-LY Loop Yagis antenna can be purchased from several advertised ATV dealers and is U.S. Distributed by Spectrum International of Concord, Massachusetts. Suggested retail is \$64.70.

1296 MHz Loop Yagi



si

SPECTRUM INTERNATIONAL, INC.

P. O. Box 1084

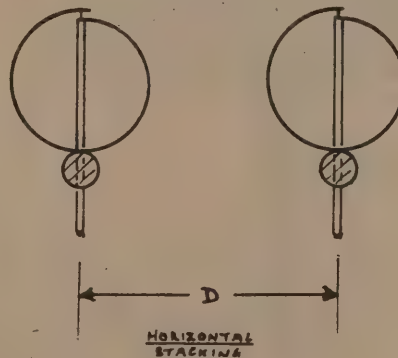
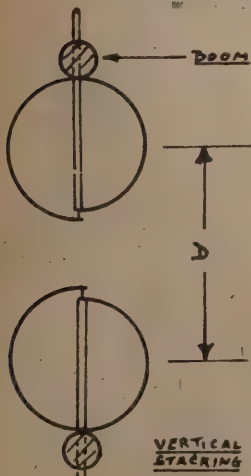
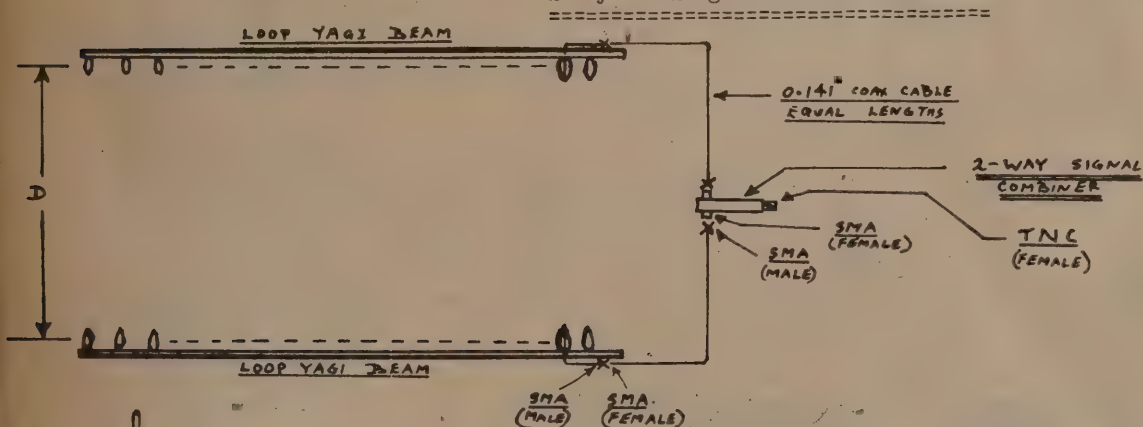
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MONEY SAVING MAIL ORDER PRICES:

System 10	— Complete system with 10 dB antenna	\$239.95 + \$3.00 shipping
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SA-16	— 16 dB gain slotted antenna with BNC connector.	\$ 40.00 + \$2.00 shipping
CA-10	— 10 dB gain circular horn antenna with BNC connector.	\$ 20.00 + \$2.00 shipping
RX-2300	— Prebuilt multimode microwave downconverter. (90 day warranty)	\$150.00 includes shipping

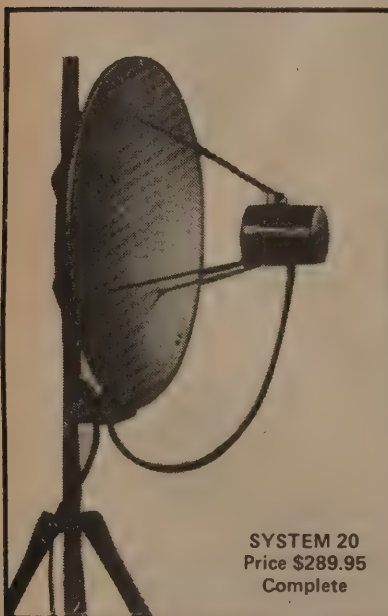
Be sure to specify channel output when ordering.

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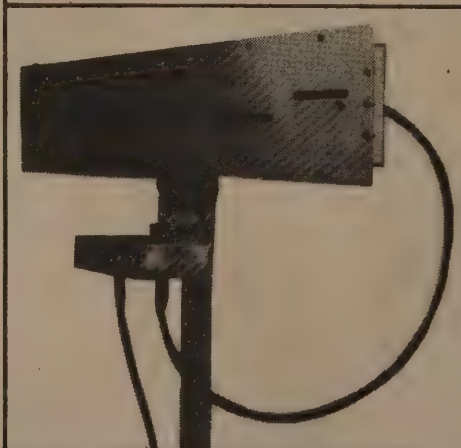
Deduct \$20 from System Price when you specify your power supply in kit form.

All of the above antennas are shown positioned to receive vertically polarized signals. In order to receive horizontally polarized signals, rotate 90 degrees. Also, masts and tripods are not included in our system packages.

Deduct \$20 from System Price when you specify your power supply in kit form.



SYSTEM 20
Price \$289.95
Complete

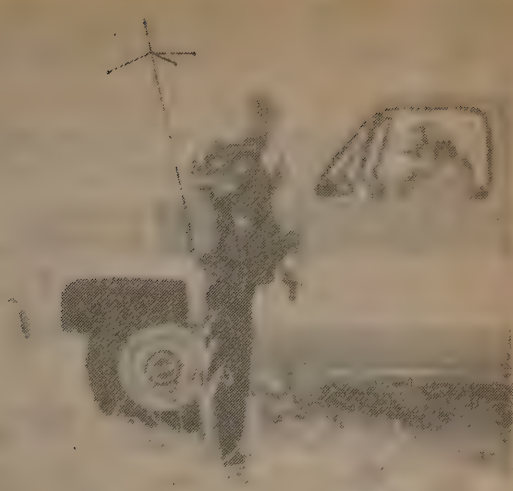


SYSTEM 10
Price: \$239.95
Complete

These are full-size, commercial quality systems, NOT PLASTIC MINI's



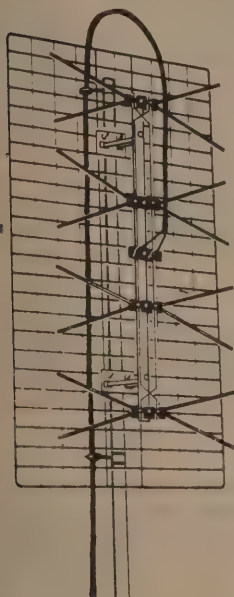
KAØBVT Iowa ATV/2 meter System



WBØKFB Jim Buttleman "REMOTE"

WINEGARD INTERCEPTOR®

Models KU-420, KT-420

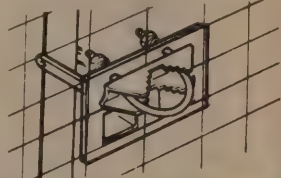


4-Bay Bowtie

Point toward
stations

antenna arrays are usually well below many UHF channels, it is very handy to have a separate UHF-TV antenna preferably mounted on a rotatable mast to turn 360 degrees covering all areas. (Also gives a nice addition of TV channels). Some areas are VHF commercially served with no UHF broadcasting stations for hundreds of miles and separate UHF TV antennas are "hard" to find. This antenna pops up occasionally at "hamfests" when areas are changed over to cable-TV and generally runs \$20-25.00. It can be easily mounted on existing masting and takes up little room for non-interference (37" X 20"). Other designs can be homebrewed and designed to known station UHF frequencies. If the pictures are P3-P5 and especially if the audio subcarrier is coming through, the ATV band is most likely ripe for the picking!

Specifications: 8 inch by 8 inch bent elements-2 to a section-total of eight sections, 300 ohm feed, 24 inches from top center V to bottom center V, 1 1/4 inch separated multi-joining feed run connection (wire), 5 1/4 inch distance from reflector screen, 10-2 inch X 36-1 inch vertical screen back reflectors,



For channels 14-82 UHF



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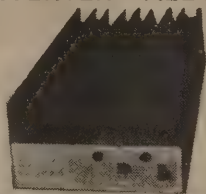
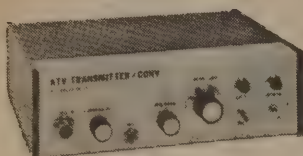


11119 Allegheny St., Sun Valley, CA 91352

WHY GET ON FAST SCAN ATV ?

- You can send broadcast quality video of home movies, video tapes, computer games, the shack, etc., at a cost that is less than slowscan. Requires only a technician class or higher.
- Really aids public service communications for parades, RACES, CAP searches, weather watch, marathons, etc.
- DX is about the same as 2 meter simplex - 15 to 100 miles.
- ATV uses broadcast standards. No special converters needed. Receive full color and sound on a regular TV set.

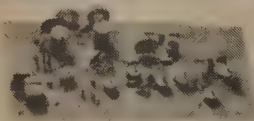
TC-1 TRANSMITTER/CONVERTER ALL IN ONE BOX READY TO OPERATE \$ 399 delivered U.S.



Plug in camera, antenna, mic, and TV set and you are on the air. Contains the 4 basic modules, AC supply, and T/R switch. Full color and sound. Specify xmtr freq and TV ch 2, 3, or 4.

MIRAGE D1010-N modified for ATV . . \$ 299 delivered U.S. Runs 90 watts p.e.p. on atv. Requires sync stretcher in exciter. Add \$ 50 if you would like us to match the TC-1 to the D1010-N.

Build Your Own System with The Basic Four Modules



1. TXA5-4 ATV EXCITER/MODULATOR \$ 89 ppd

This wired and tested module is designed to drive the Motorola MHW-710 module in the PA5 10 watt linear amp. The crystal in the 100 mHz region keeps harmonics out of two meters for talk back. The video modulator is full 8 mHz for computer graphics and color. Requires 13.8 vdc reg @ 70 ma. Tuned with xtal on 439.25, 434.0, or 426.25 mHz. Two Freq \$ 115 ppd.



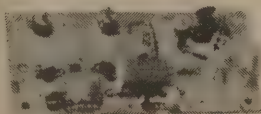
2. PA5 10 WATT ATV POWER MODULE \$ 89 ppd

The PA5 will put out 10 watts RMS power on the sync tips when driven with 80 mw by the TXA5 exciter. 50 ohms in and out, plus bandwidth for the whole band with good linearity for color and sound. Requires 13.8 vdc regulated @ 3 amps.



3. FMA5 AUDIO SUBCARRIER GENERATOR \$ 29 ppd

Puts audio on with your camera video just as broadcast TV does at 4.5 mHz. Puts out up to 1 v p-p to drive the TXA5 or VM-2, 3, or 4 modulators. Requires low Z mic (150 to 600 ohms), and +12 to 18 vdc @ 25 ma. Works with any xmtr with 5 mHz video bandwidth.



4. TVC-2 ATV DOWNCONVERTER \$ 55 ppd

Very sensitive stripline MRF901 (1.7 db NF) preamp and double balanced mixer module digs out the weak ones but resists intermods and overload. Connects between uhf antenna and TV set tuned to channel 2 or 3. Tunes 420 to 450 mHz. Requires +12 to 18 vdc @ 20 ma. Super sensitive TVC-2L with NE64535 preamp (.9 db NF) stage \$ 69 ppd.



TVC-4 ATV DOWNCONVERTER \$ 89 ppd

This is a packaged version of the TVC-2 converter with internal power supply. Has BNC input and F output connectors. Also available with the NE64535 for \$ 105 ppd. (TVC-4L) Size 5 1/2 x 2 1/2 x 7 inches.

PACKAGE SPECIALS

TXA5-4, PA5, FMA5, and TVC-2

BASIC MODULE PACKAGE . . . \$ 249 ppd

OPTIONS:

2 frequency exciter add \$ 26

NE64535 low noise downconverter . . . add \$ 15

Packaged TVC-4 downconverter . . . add \$ 34

Magnacraft W120X-14 coax relay . . . add \$ 41

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5" COLOR AC/DC PORTABLE TV/MONITOR\$299ppd

Liberty model 5010 has video and audio inputs and outputs Use as a color video monitor, standard TV, VCR tuner, or repeater receiver. Operates on 117vac, external 12vdc, or internal D cell batteries (not supplied). 12 x 12 x 6"

TVX-1 TELEVISION TRANSMITTER\$500ppd

This is a complete 10 watt UHF TV transmitter in a 3½" high 19" rack panel intended for community television outside the USA. Available on *TV channels 14 thru 20 or on ham ATV frequencies. Takes baseband video and line level audio input from a TVRO, VCR or camera. Also a mic input for voice overs. 117vac 60 hz supply. Monitor output. 4 to 6 week delivery depending on frequency.

*Only ham freq. available for use in USA.

D1010-N MIRAGE ALL MODE 100 WATT AMPLIFIER....\$299ppd

420 to 450 mHz, FM, SSB, CW, and ATV. Up to 90 watts pep on ATV with only 4 watts drive. Req. 13.8 vdc reg. at 20 amps. Uses "N" connectors. 12" x 3" x 5½". Specially modified by us for ATV.

MML432-50 MICROMODULES 50 WATT AMPLIFIER...\$269.95

+ UPS

All modes, builtin low noise preamp, 5 in/40 pep out on ATV. Req. 13.8 vdc reg. at 8 amps. BNC connectors. 11" x 5" x 2.2". Charge card or COD only on this unit. Requires sync stretcher added to TXA5 Exciter.

DM-1 RF/VIDEO DETECTOR & MONITOR.....\$20ppd.

Samples RF off xmtr coax and outputs 1 v p-p video to monitor your own camera and setup. Also outputs to a external 50 uA meter for relative power. Req. +12 to 18 vdc at 25 ma. PC board only\$ 5ppd.

TVG-1 and TVG-12 ATV TEST GENERATORS\$15ppd ea.

Connect your camera and you have about one milliwatt on the air for demos, ant tests, or receiver alignment. Req. 9vdc at 7 ma. TVG-1 tunes 400-480 mHz and TVG-12 tunes 1200-1300 mHz.

TSQ-1 TV S-METER AND SQUELCH BOARD\$5ppd

Add common or Radio Shack parts, tap into TVs video IF AGC line, break one speaker lead, and you can better align the antenna, give relative signal reports, and have no noise between contacts.

VIDEO SPECIAL AFFECTS:

Family of plugin cards designed to superimpose characters, supply external sync, and other effects to be added later. Start your effects cardage now with the VDM-3 and VID-3. A must for repeaters!

VDM-3 VIDEO DISPLAY MIXER 2 camera switcher, superimpose mixer, V & H drive outputs, and raster gen.....\$69ppd

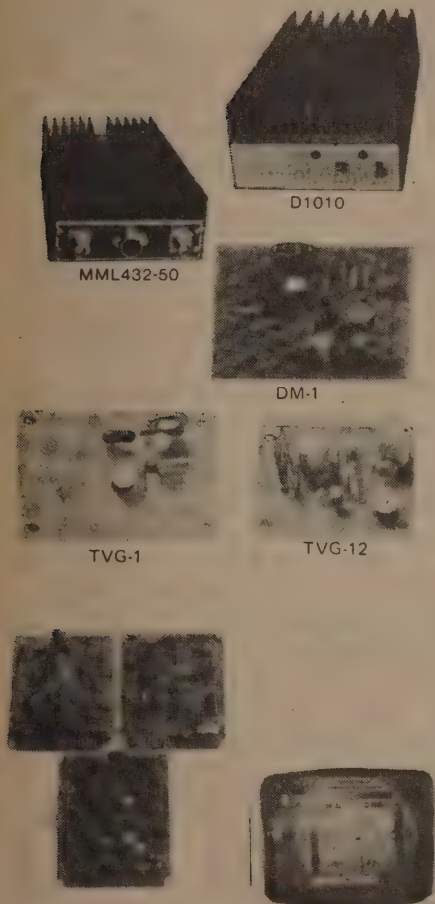
VID-3 VIDEO IDENTIFIER Superimposes call or any 6 letters in camera video. 1 programmed PROM included. Works with VDM board....\$69ppd

IDS-3 ID SEQUENCER steps thru up to 5 PROM ID memories to show call, city, CQ, repeater, etc\$49ppd. PROMS \$15 ea.

CBG-3 COLOR BAR & PATTERN GEN. Uses 16 pattern MM5322N chip. Camera & gen video switcher, xtal controlled, many features.....\$99ppd

AIM-3 AUDIO & ID MIXER. Mix & remotely switch or attenuate 4 audios & programmed MCW ID. Line & .4W speaker outputs\$69ppd.

NEW



CBG-3 COLOR BAR AND PATTERN GEN

The Color Bar & Pattern Gen board outputs 3 color patterns, 12 dot or bar patterns, and a blank raster. These patterns are handy for TV alignment or test video on ATV repeaters. The output can be remotely switched between the patterns and external camera video with the on card video switcher.

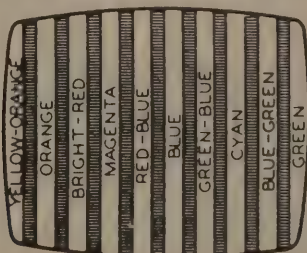
The video out is the standard 1 volt p-p into a resistive 75 ohm load at a transmitter or monitor. Camera video input is also designed for terminating into 75 ohms. To switch between the pattern video and the camera video, a switch is placed between pin 18 and ground. Open is the camera input and closed to ground gives the patterns. The pattern is adjustable using the Video Level pot from 0 to 2 volts. The color amplitude is also adjustable from zero to .7 volts (typical setup is .3 volts of burst on the horizontal backporch with 1 volt of composite video). A variable 0 to .8 v 3.56 MHz is also available at pin 7 for tests and other applications. If your scope does not have a sync separator a 10K pullup resistor can be put between pins 10 and 12 and used as a external horizontal sync trigger to stabilize the scope pattern.

A momentary push button or open collector pull to ground from a tone decoder is used at pin 19 to step sequentially thru the patterns. In the case of ATV repeaters, a TX+ preset at pin 14 or a pull to ground at pin 20 is available that will put on the jumpered favorite pattern. Usually the color rainbow or crosshatch is selected to come on for about one minute after a received video signal is dropped with the video ID superimposed. The jumper pads are BCD numbered but are more easily selected by stepping to the favored pattern, checking for a high or low at the MM5322 pins 3 thru 6, and then soldering in the jumper to the adjacent ground pad of the corresponding line that is low.

A regulated 12 vdc supply at 40 ma is required. Make sure the card is plugged in correctly before applying power. The dual 22 pin Radio Shack RS276-1551 connector has the letters and numbers next to the solder pins, and the card has the lettered connections on the component side.

A 7127.6 kHz crystal oscillator is divided by 2 to give the 3.5638 MHz color rainbow frequency. You may wish to discover other color patterns or solid colors by substituting a variable series resonant circuit in place of the crystal. If so note the frequency on a counter at pin 7, multiply by 2 and get a crystal on that frequency. For instance a standard color burst frequency of 3.579545 MHz times 2 (7159.1 kHz) will give a all green raster. The crystals are HC25, .005%, series resonant, and 15 pf load capacity. The other crystal oscillator determines the sync frequencies. The 4520 divides it by 16 and the MM5322 does the rest for the horizontal frequency of 15734 Hz.

If no jumpers are applied, the initial pattern upon power up will be the rainbow (1111) since the presets all have pull up resistors. The most popular patterns are the ten color bars (0001) and the 7x11 crosshatch (0101) for ATV repeaters in the beacon mode. The crosshatch especially seems to show up best in weak signal conditions.



10 color bar pattern
(0001)

(c) W6ORG 11-81

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SATELLITE

Russia launches satellites

Six Russian satellites, RS3 through RS8, were launched on 17 December and are now in a nearly circular orbit around the Earth at an average altitude of nearly 1700km. The six are steadily moving away from each other with slightly differing orbits, and by 28 December their equatorial crossing times were spread over more than an hour and crossing points nearly 20 degrees.

All six have been transmitting telemetry data, with each series preceded by the spacecraft's call (e.g., "RS3"). RS3, 5 and 7 all have the "robot transponders" described in *HR Report* 354, and at least one has been worked by a number of stations around the world. Robot availability is indicated by a "CQ" stopping when a signal appears in its input passband. Sending (for example) "RS5 de W9JUV AR" should bring the response "W9JUV de RS5 QSO nr xxx." It may also respond "QRZ," "QRM" or "RPT" if it misses a call, or "QRQ" or "QRS" to calls made below or above its 10-25 wpm acceptance range.

Beacon frequencies for the even-numbered birds are: RS4, 29360-29403; RS6, 29411-29453; and RS8, 29461-29502. Their 40 kHz-wide OSCAR-style transponders have apparently not yet been activated. One indication of transponder status in any of the six is the first, or "K," group telemetry number, which indicates power output. A reading of anything other than "K00" should mean the transponder is on.

Interference to the RS satellites from terrestrial stations is becoming a real problem, with their covering so much of the 29.3-29.5 MHz spectrum. SSB, AM and FM signals have all been heard in recent weeks on top of or breaking over onto the new satellites. Non-satellite users should try to stay below 29.3 or above 29.5 to avoid the problem.

— *HR Report* WOPR DRADIO, February 1982

Amateur Television/Satellites Must Co-Exist!

According to the November #116 issue of CQ-TV Magazine (BATC), a lot of controversy arose as a result of the statement made in Radio Communication Journal, (July 1981 issue) in that "Fast-scan Amateur TV in the relatively confined space of 434-440 Mhz. may in the future find itself in conflict with the Satellite allocation of 435-438 Mhz. In view of this (the article continues), it is recommended that TV should move to the wide open spaces of the higher bands during the coming years." FSTV'ers in Europe, took this as a direct attack on their right to continue to operate ATV on 70 cm. A "flood" of protesting letters was received by the RSGB and AMSAT-UK. The BATC committee met to consider this situation and voted to have Graham Shirville G3VZV to act as liaison on behalf of the ATV group. The return comments from RSGB was that "too much had been read into the statement" and hopefully ATV and Satellite users could co-exist without causing mutual interference. It is further noted that BATC recently contacted officials of AMSAT-USA and the AGAF (German ATV Association) as well as their membership to assure that the situation is, and will continue to be monitored very closely. A5 ATV Magazine salutes BATC on a job well done!

Here in the United States, there is growing talk of trying to move ATV from 70 cm. How soon we forget just who populated the 400 Mhz. band when not long ago the frequency range was considered "no-man's" land and Amateur Television "grew" on 70 cm. only because that is where it was placed. It is the ATV'er who pioneered the progress on this band—not the Satellite enthusiast who even today populates the band without a respectful knowledge of "weak-signal" or ATV activity. Satellite operation is indeed a unique and modern-expanding mode of specialized-communications & ATV Magazine supports it. But, we are going to also monitor activities and comments by AMSAT, ARRL and others and will rise promptly to any attempts to degrade or move Amateur Television. Complimentary copies of ATV Magazine are sent each month to the ARRL League, several officials and other groups to reassure the strength and growth and interest in Amateur Television.

The May issue of A5 ATV Magazine will carry a very nice article on SSTV-Oscar Satellite exchanges between W7AMQ Gayle Sells in Portland, Oregon and W7KPW Bob formerly of Glendale, Arizona (now Texas). SSTV/Satellite operation can be found near 29.460 with an input of 145.920 Mhz. How many others are utilizing Satellite and TV?

OSCAR-9 telemetry

Bruce Balla, VE2QO

Telemetry from OSCAR-9 since launch on 6 October 1981 have been asynchronous data transmissions. One speed used is 300 baud ASCII. The format is afsk using 1200 hertz (mark) and 2400 hertz (space).



**HEAR
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satellite band.



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preamp**
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ALL ABOARD TVRO

How to Build Your Own Satellite Receiver.

Now that you have completed the audio circuit, and are anxious to get on with the show, we will attempt to construct a video demodulator. This is one of the toughest boards to build in the seven part series, and truly is the heart of the system.

This circuit demodulates the 70Mhz I.F. center frequency; detects them by using a phase locked loop, contains deemphasis and low pass filters, and puts out standard NTSC video. Audio, subcarrier output, AFC, and signal strength are also included.

Similar versions of this circuit have appeared in several publications, one being Radio Electronics. The bare printed circuit board of a very similar unit can be purchased from MHz Electronics 2111 W. Camelback Phoenix Az. 85015. Ask for the coleman TVRO demodulator board. Price is around \$40. This circuit utilizes a NE564 p11, and it has several drawbacks. First of all, the device is only spec to 50Mhz and may not operate on the 70Mhz circuit. I bought four IC's, but only one wouldn't got high enough. Secondly the 564 has a limiter, which has been argued pro and con (mostly con) by the local techs. But all in all, the chip seems to be widely used with good results.

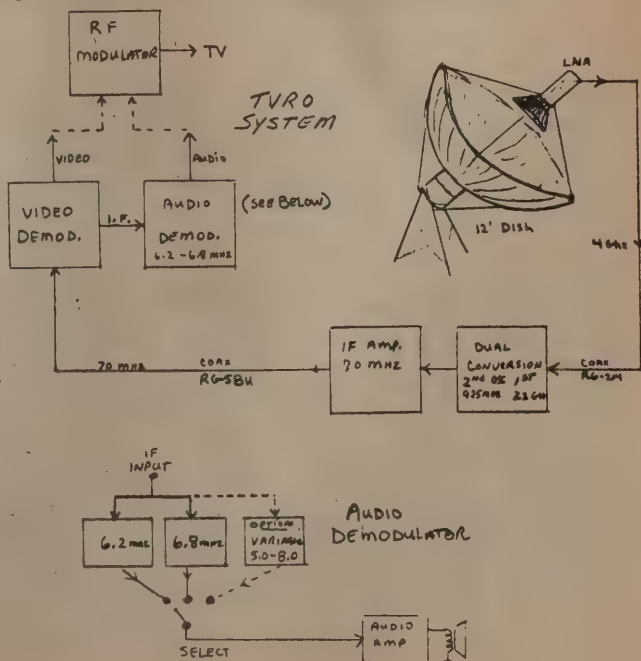
Several methods may be used to fabricate your own board. One idea was to use single-sided pc board, utilizing the foil for the component side, and gluing shimstock on the bottom for large traces and ground plane. Using wire-wrap sockets is ok., but particular attention must be paid to the 564 vco. There are no tuned stripline traces to worry about, so direct wires glued to the pc material work ok. By "spot facing" the foil with a larger drill, resistors and other components can clear the ground plane without shorting out. If \$40 is out of your pocketbook for a pre-etched board, and you don't have the time or ambition to fabricate one, a third alternative is available; a etched board, double sided .062 undrilled is available from Systems Electronics P.O. Box 241 Glenn Ellen Ca. 95442. Cost is \$25."

The MWA120 amplifier is optional, but I feel it is necessary if you plan to "split" the system. Refer to the block diagram in the last article. It is preferred to operate the dual conversion unit and the 70 Mhz I.F. amp together up at the antenna. Then simple RG-58 can carry the 70 Mhz signal down into the shack with little attenuation. Depending on length, a certain amount of loss is to be expected thus is the reason for the extra MWA120 amp.

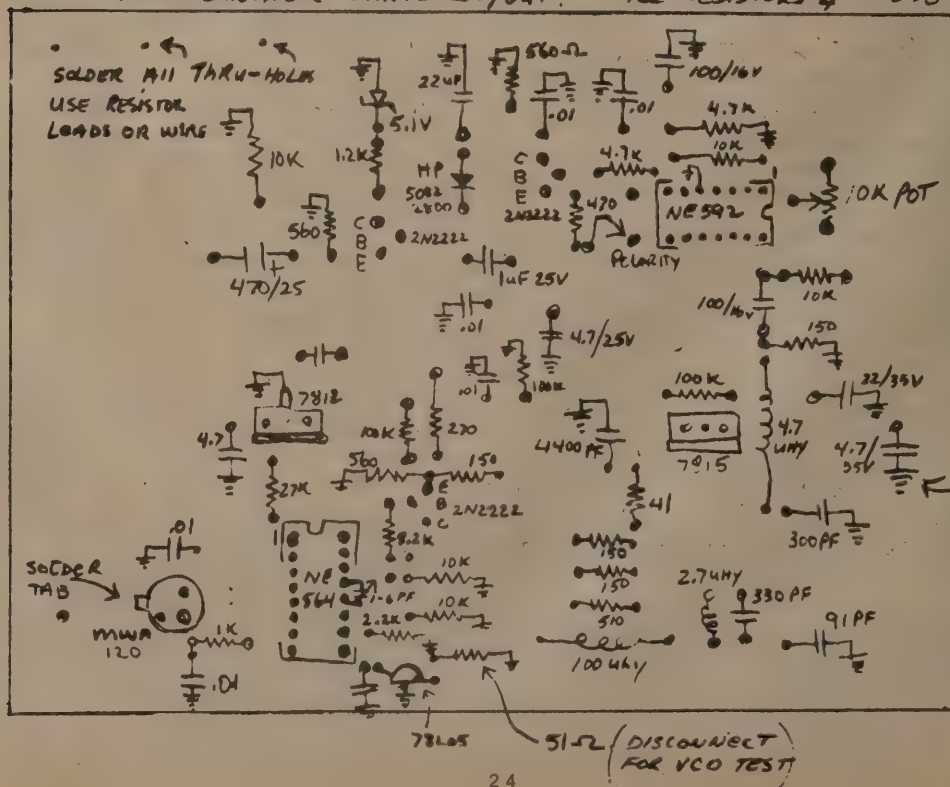
The NE592 video amp can be selected for positive or negative video. If a switch is to be used, use shielded wire and keep leads short. The video gain pot should be adjusted to 1.2 volts peak to peak on a color signal, or 1 volt pp on black & white. Set the trimmer cap on the 564 to 70Mhz out at the pin 11 test point. Try soldering the trimmer directly across the leads on pin 12 and 13. This is especially necessary if you plan on using a IC socket.

Several components must be soldered underneath the pc board on the traces. The .01 input cap and output cap on the MWA120 should be zero lead length and soldered directly to traces. Bend leads at close right angles, and stand cap upright, use min. solder. These points are labeled "V" on pc board. Points labeled "X" should be connected with a 300 ohm $\frac{1}{4}$ watt resistor. Solder a 3pf cap between points marked "Z" and also between "S". These 3pf caps go thru the board and solder to ground. Connect points "r" with a 560 ohm resistor. A .01 cap from pin 11 of the NE564 must be soldered on traces across "V". DC plus should be connected to 18 to 25 VDC. Next article coming up will contain the 70 Mhz I.F. board, which is by far an easier project than this one...

73's Gerard Wilson
WA6RDA



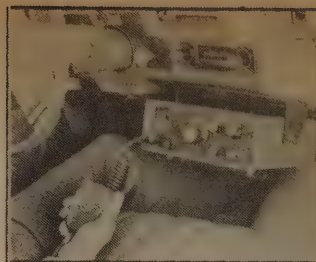
* DEMODULATOR PARTS LAYOUT. ALL RESISTORS $\frac{1}{4}$ W 5%



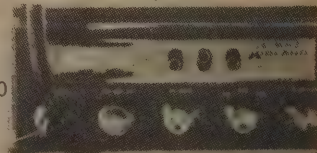


SSTV MOBILE? WHY NOT!

Mike Stone WB0QCD

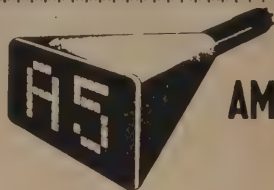


Okay, I'll admit it's a bit of trouble, but think of the fun! Stations are amazed at the quality of SSV signals received from a low-power mobile station. My highlight was back in the spring of 1981 when I loaded up everything in the car including the German SC422 converter, a videotape recorder, my RCA-007 camera, a Zenith TV set and a small cassette recorder. I equipped the car with a 12 volt to 110vac inverter for powering the converter and 12 vdc ran the videotape player off the cigarette lighter which then gave power to the camera system. The tape recorder (GE Model 3-5314A) ran off internal batteries and lasts for a long time. The "secret" of good mobile transmissions direct off the recorder into the microphone input is a good quality recorder with minimum wow and flutter response and correct audio microphone gain levels. ZS6BTD Gerald in South Africa was amazed at the pictures coming in from the midwest "mobile" station and returned P4-5 pictures. I have worked many of you and the ole' 78 Ford LTD is turning almost 90,000 miles and 37 SSV contacts! Admittedly, I usually only run my HF rig and a tape recorder (audio) for most of my contacts, feeding the prerecorded SSV picture video into the microphone input circuit giving great one-way pictures to the stations I operate. I do, however, record video signals off the HF rig and then play them back later at home on the base station. During 1981 my converted CB rig (Midland 13-893) outputted about 8 watts SSB and logged alot of contacts. This year, I am calling CQ SSV on a 250 watt PEP 10-80 Meter Swan 100MX. If you "see" a white car on your screen, it's me!



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OUR 15TH YEAR!

AMATEUR TELEVISION MAGAZINE

QCD Publications



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- #3 Slow-Scan Television - How to get started, cameras, lighting, DX chasings, and lots more!
- #4 Color Slow-Scan Television - From the early day's in 1972 to Color that is being sent today.
- #5 Popular Robot 400 Converter "modifications" - mini-pix, sync removal, overlay, Color mods!
- #6 Facsimile - Collection of FAX articles and information (now legal on all Amateur bands!)
- #7 Radioteletype - RTTY basics, printers, video or hardcopy?, terminal units, operations, etc.
- #8 Satellites - Communications via Amateur Satellites, Voyager I and II (SSTV), and more!
- #9 Computers - Clay Abrams great series on 6800 and TRS80C Computers, other computers also.
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WEATHER FAX

LANDLINE WEATHER FACSIMILE
SYSTEM RECEIVABLE BY SSTV?

PIONEER YOUR OWN SYSTEM!

Up to the minute radar information of precipitation for your area is available from the U.S. Government, NOAA and the National Weather Service by dial-up telephone. NOAA and the National Weather Service (NWS) make available weather information to non-government users. This is referred to as the Extension Service. In order to qualify for this free service, potential users are required to sign no cost agreements covering the use of the service. Copies of agreements are obtained from National Weather Service, Grammax Building, Silver Spring, Maryland. Use of this service to the Amateur could be utilized a number of ways; ATV Weather monitoring, Repeater user feature, Feed to local CD officials, etc. This development by the CATV Division of Arvin Company, Carroll, Ohio converts the telephone signal directly to NTSC video by means of an SSTV Scan Converter. Old information that was available to A5 Magazine lists 37 NOAA radar sites which is most likely more today. The Arvin TW-1 TeleWeather unit gives colorized output and displays the location and intensity of rain, hail, snow, thunderstorms, hurricanes and potential tornado cells. These 37 known stations are in 26 states:

Alabama	Centreville	Kansas	Wichita, Garden City
Colorado	Limon	Louisiana	Sidell
Florida	Miami, Pensacola	Maine	Brunswick
	Apalachicola	Maryland	Patuxent River
Georgia	Athens, Waycross	Massachusetts	Chatham
Illinois	Marseilles	Michigan	Detroit
Iowa	Des Moines	Missouri	Kansas City, St. Louis, Monett
Nebraska	Alliance	South Carolina	Charleston
New Jersey	Atlantic City	South Dakota	Huron
New York	New York	Tennessee	Bristol, Nashville, Memphis
North Carolina	Cape Hatteras	Texas	Galveston, Stephenville, Hondo, Brownsville
Ohio	Cincinnati	Wisconsin	Neenah
Oklahoma	Oklahoma City	(others have possibly been added-check your area)	
Pennsylvania	Pittsburgh		

The "dial-up" basis has been available for many years, but old facsimile recorders were not able to handle the video signals well. The SSTV converter receives the facsimile signal, enters it into a memory bank, and then reads the memory at video rates. The output is colorized and has a rotating radial line to provide animation. The 3 khz. signal sent by phone-line by NWS facility, contains 25 mile marking tracks and has a visual range of 125 nautical miles (145 statute miles) in all directions. At the NWS facility a SSTV camera photographs the actual weather radar display scanning 480 lines per minute, 800 lines per frame (15 lines of retrace included). The output of the SSTV camera is fed into a facsimile signal generator and the AM signal is then fed into a dedicated phone line. FM conversion is also fed by a Multiple Access Device which will additionally disconnect the phone user after two complete pictures are sent. Radar sweep scan takes 100 seconds with standard NTSC 60 frames per second. Some sample WX numbers are Des Moines, Iowa 515-285-6315 or 6345, Chicago, Illinois 815-795-5447 (8&9).

HOW CAN THIS SERVICE BE UTILIZED BY AMATEUR SSTV?

If anyone could come up with a TW-1 manual or schematic a better understanding of what is needed to receive the outputted signals on Amateur SSTV equipment of FAX machines. Removal of the sync pulse reset in Robot 400 converters can be accomplished by the lifting of pin #6 of U-14 on the circuit board. K6AEP Clay Abrams is working on a possible program for the TRS-80C Color Computer utilizing the Color software display features. Lets have some articles and further information on SSTV Weather !

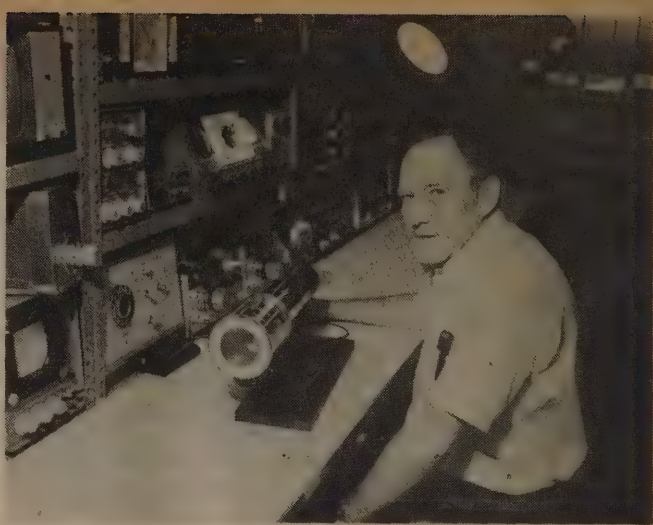


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Tel: (212) 372 - 0349

TULSA'S WEATHER "HAM" WARREN WELDON W5DFU

If you missed Warren Weldon's slide show at Dayton last year, you really missed a fine presentation! Warren has been active in ATV both FSTV and SSTV for a long time and began to experiment using the TV modes in early 1976 for the monitoring and relaying of "live" video signals of Tulsa's weather conditions to the NWS (National Weather Service). This experimentation became a reality in April 1976 after many years of planning and building up the elaborate system. His setup consists basically of B/W and Color Cameras mounted on the tower with full rotating 360 degree and vertical capability, 300 watts of FSTV video from PC Electronics



gear feeding an 88-element "J" Beam which provides approximately 12 KW video. His earlier setup was a bit more moderate using a modified CMU-15 at 10 watts feeding a corner reflector antenna. His tower mounted weather-camera has a "shack" motorized 15-150 mm, F2.8 zoom lens, electrically driven miniature windshield washer arm with heater, "sun-sensor" to avert accidental pointing at the sun all housed in a weather-proof cabinet. One of the constant problems Warren has been fighting is the warm weather in the summertime. Color Cameras do not like warm outside temperatures as he has found out the hard way. A "thermo-electric" cooling system on the front of the yoke vidicon just might be the answer. Stripped vidicons are usually rated at 104 degrees maximum temperature but Warren would like to know if anyone has any information on operations at warmer temperatures to safe tolerances. Anyone with any "thermo-electric cooling" information or has access to single purchases of "modules" please contact Warren. (Most manufacturers are not interested in selling just one unit). At the request of the NWS and KOTV Channel 6, Warren installed a weather radar "repeater" transmitter (at the 500 foot level) on the 1100 foot tower. Operation is on 434 Mhz. and uses a PC Electronics PA-5 10 watt ATV Module into a DX-420 colinear antenna array. RG-11 brings up the Color radar color signal to modulate the repeaters transmitter. The remote tower is 14 miles from the NWS office at Tulsa airport and this linkup provides them with a clear view of a storm centered over the airport area that is most assurdly lost in local ground clutter. The repeater system also provides color-density coded images of cities, roads, rivers and county boundaries (overlay) and provides a secondary "backup" system in case the main NWS equipment should ever fail. The tower mounted repeater system has been through absolutely miserable conditions and has never failed to do its' job (a tribute to W6ORG's equipment modules). The entire system is under the direction of the Tulsa Repeater Organization as described at the 1981 Dayton talk. Since installation of this weather service by Amateur Radio, many groups and agencies have been interested in installing a similar system in their communities. Warren may be contacted and will be glad to discuss the needed setup and equipment anytime. Keep up the good work Warren and again, congratulations on your 1981 award "Good Image" by A5 ATV Magazine. Warren's address is 2304 N. Osage Avenue, Tulsa Oklahoma 74106.

"Uncle Warren's ATV Remedy's" Owners of the MBM48 or 88 element "J" Beams will be interested in this simple modification to assure correct positioning of the quaqi driven elements. The assembly of the driven and relective elements at best are still a bit wobbly and the owner will certainly become a bird hater as the elements are moved out of phase after landings and takeoffs or during windy weather. The answer is by drilling small holes through the aluminum casting that support the center horizontal rod of the reflector (into or through the rod itself) and install very small drive screws, sheet metal screws or cotter pins to keep the reflector from being moved out of its' proper position. This is a must when the beams are used horizontally! My second ATV "remedy" is for obtaining ON-CARRIER FM SOUND. Why not use the UHF tuner section in your TV set? Loosely couple a lead from the UHF converters osillator compartment to the antenna system on the added ATV Downconverter and tune the UHF converter to around channel 19 (UHF) for 439.25 Mhz. signal. Fine tuning the UHF converter will bring the sound carrier in easily and surprisingly quite clear. ON-CARRIER sound has DX advantages where the normally used FM audio-subcarrier is surpressed greatly within the video carrier. Sound alerts or FM communications can be conducted easily without video pictures with a squelch circuit to the TV set's AGC circuit.



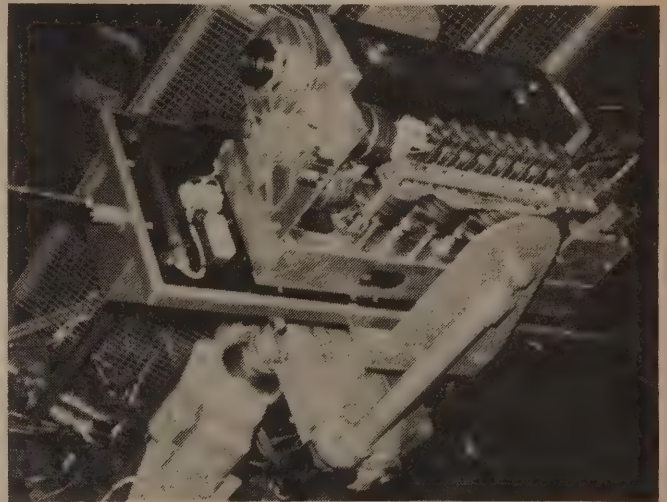
Tulsa Skyline 500' Level 434 MH2



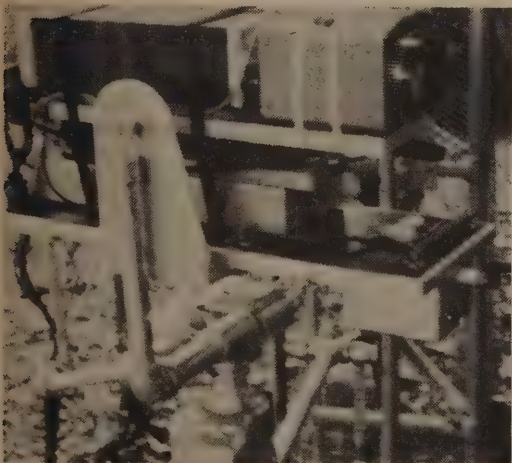
Tower Mounted "Weather Camera"



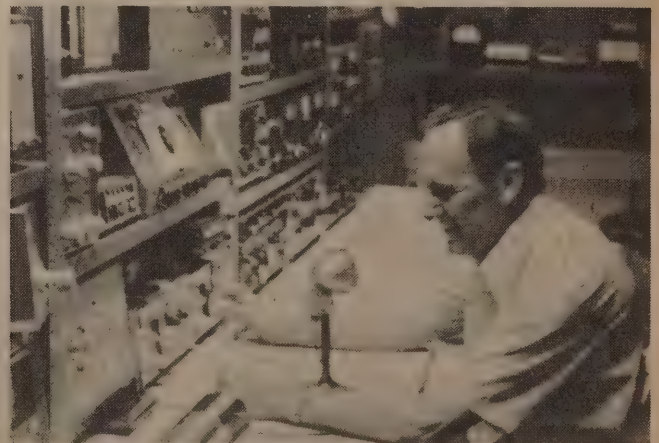
11 Element Yagis on NWS Radar Tower



Weather Camera System



Inside Look At W5DFU Special Camera



Warren Weldon at Operating Position

The New TRS-80 Color Computer

RTTY and SSTV

PICTURE PRINTING

BY: CLAYTON W ABRAMS

1758 Comstock Lane
San Jose, CA 95124



=====

An area of amateur radio which has not been explored to any degree is picture printing. Most of this work has been done on RTTY and all manually. With the availability of low cost microprocessors the migration to computers from the manual job of creating pictures is a natural evolution. In this article I'll provide some tools for experimentation and demonstrate how it can be done.

My first attempt in this area were rather crude (ref 1,3). These experiments were done in the days of expensive printers and marginal print quality. Since that time an explosion of low cost printers have been introduced to the US market from Japan. These printers are both low cost and produce excellent print quality. Some of these printers even have the capability to print graphics and pictures.

In this article I would like to offer a software programs written in BASIC and 6809 machine language to explore picture printing further. This package will allow pictures to be loaded into the computer from tape, and to produce a hard copy. Another feature of this program will allow the printed picture to be placed onto a second tape. This tape can be loaded into another program and transmitted on amateur radio teletype or CW.

If you are interested in doing this you must have some computer hardware. The most important item is a Radio Shack Color Computer. This computer must have 32K RAM and also contain extended BASIC. The attached program could be converted to regular BASIC by making a few changes. The next items are both the SSTV7.4 and the RTTYCW software. For more information on this software availability drop me a line. Since this article is on printing, obviously you need a printer. The attached program does not require the use of a graphics printer. But if you wish to produce pictures like the one provided with this article, a EPSON MX-80 with the graphtrax feature should be obtained.

THE PROGRAM

If you have the necessary hardware key in the attached program and

save it on tape for later use. The next step is to record on tape some SSTV pictures from the SSTV7.4 program. These pictures can be obtained from a digital scan converter or received over amateur radio. Once a SSTV Picture tape is recorded load the BASIC program into the computer and type RUN. A prompt message will ask you to place the SSTV tape into the recorder and make it ready. Once it is ready hit any key on the keyboard and the tape will run. A machine language program will be executed and the SSTV picture on tape will be place into memory. This machine language program is in lines 510 to 780. This program is POKED into memory by the program steps 30 to 60. The machine language tape load program is executed by steps 140 and 150. These setps can be modified if you do not have extended BASIC. Once the SSTV picture is loaded you now have a choice. You can print the picture or make a second tape which can be loaded by RTTY. The RTTY picture could be transmitted over ham radio and received by someone with a printer. Lets assume you wish to print the picture. If you do this the program will next execute steps 900 to the end of the program. These steps print a picture with 64 characters on 42 lines. The program does not use over printing but substitutes characters for gray levels. The gray levels used are in steps 820 to 840. The darkest characters are first and lightest are last. The characters can be substituted depending on you preference. The characters are: 35 pound sign, 37 per cent, 33 !, 43 +, 34 ", 46 ., 32 space.

If you did not select SSTV the second program option is RTTY. This program is selected by selecting 2. Lines 270 to 360 will poke the SSTV picture into memory. The picture in memory will look like the printed SSTV picture. The program will next ask you to mount a tape and get ready to record the picture. Steps 400 and 410 execute a machine language program in memory to make a tape. The machine language program first asks for a name to be placed on the tape. This name allows you to find the tape with the RTTYCW program. As soon as the name is entered and enter is pressed the tape will start to write. Once the tape is written it can be loaded by RTTYCW. A twist to picture printing on RTTY is picture printing on CW. I wonder if this has ever been done before? This would be a simple job with the RTTYCW program. Since some of the characters in the lookup table are not baudot the picture can be transmitted only on ASCII. If you wish to use baudot substitue other characters. Additionally the automatic carriage return in RTTYCW must be deselected.

GRAPHICS PICTURE PRINTING

A very exciting area of SSTV still unexplored is graphics picture printing. Many of the newer printers have the capability to allow the programmer to gain control of the wires on a print head. With this capability almost type of printing is possible. With a little cleaver software one can extract a picture from memory and produce a hard copy on paper.

The EPSON MX-80 is an ideal printer for picture printing. With a special programming package called Graphtrax it is possible to print gray level pictures. This feature consists of three EPROMS (2716's) and instructions. When installed in the printer it is possible to program the printer to print each wire of the nine wire dot matrix. This feature allows up to 960 dots per line to be printed on the horizontal. Attached is a SSTV picture printed on the MX-80 printer from the TRS 80C computer. This picture contains 128 pixels per line with 16 gray levels. The picture was captured with the SSTV7.4 program. The printer program SSTV7.5 was loaded co-resident and executed when picture printing was desired.

The EPSON printer is interfaced to the Color Computer through the RS-232 interface. The printer must have a serial card adapter. EPSON recommends use of their buffered serial board which contains a microprocessor and memory. I found this approach to be rather expensive. I determined that an interface could be constructed for approximately \$20 which replaces the EPSON interface. This interface functions as well as the EPSON interface and is one seventh the price. One shortcoming of picture printing is the time it takes. With the home brew interface operating at 4800 Baud and high density picture (960 dots per line) 14 minutes and a low density picture (480 dots per line) 5 minutes. A commercial interface is available which also does the job. This interface is called the parallel O! and is available from the Microworks ref 2. This interface is approximately one half the cost of the EPSON interface, however, it supports only one speed 600 Baud. At this speed the printing time is 27 minutes for a high resolution picture. It is possible to increase the baud rate of the interface to incorporate higher baud rates.

CONCLUSIONS

Picture printing can be a lot of fun. The type of pictures produced can range from simple pictures printed as characters, through complex gray level pictures. In my opinion the computer is the only way to allow pictures to be printed. With the rapid advances in the cost of printers this mode of amateur radio experimentation is now in the reach of almost any radio amateur.

References

1. SSTV Meets the SWTPC Parts 1 and 2, 73 Magazine November and December 1978
2. The Microworks, P.O. Box 1110, Del Mar, Calif 92014, Ph: 714-942-2400
3. Microprocessor Applications Handbook, Mc Graw Hill 1981, Editor Robert Stout Chapter 15, A Slow-Scan Television System Using A Microprocessor, by: Clayton W. Abrams

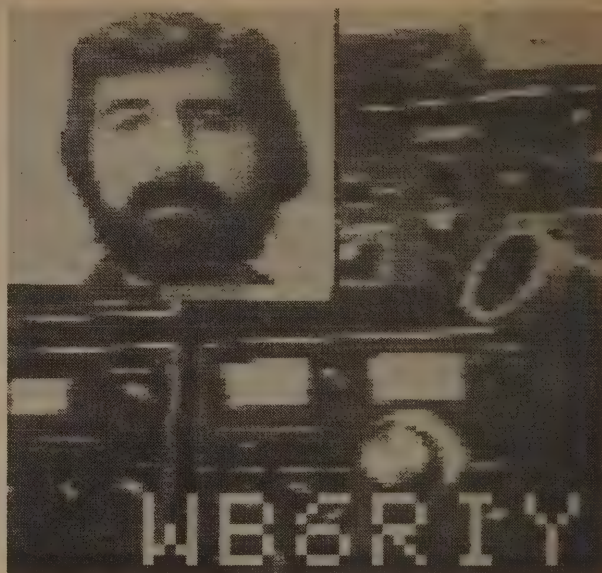
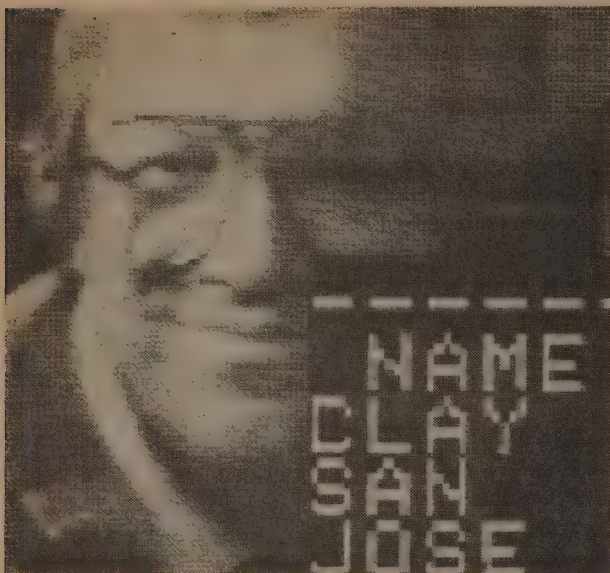

```

10 REM BASIC PROGRAM TO
15 REM PRINT SSTV PICTURES
20 REM ON PRINTER
21 REM OR MAKE A RTTY PICTURE
22 REM ON A TRS-80C COMPUTER
23 PROGRAM WRITTEN BY:
24 CLAYTON W ABRAMS K6AEP
25 DECEMBER 27 1981
30 FOR I=12288 TO 12479
40 READ N
50 POKE I,N
60 NEXT I
100 REM LOAD PICTURE
110 PRINT "LOAD SSTV CASSETTE"
120 PRINT "ENTER A KEY TO READ"
125 AUDIO ON
130 INPUT A
140 DEF USR0=12288
150 A=USR0(0)
200 DIM D(15)
230 FOR I=0 TO 15
240 READ N
250 D(I)=N
260 NEXT I
265 REM L=LINES,P=PIX/LINE
266 PRINT "SSTV OR RTTY PIX"
267 PRINT "1=SSTV,2=RTTY"
268 INPUT Z
269 IF Z=1 THEN 900
270 L=42:P=64:M=16384:C=24576
275 S=1
280 V=PEEK(M)
290 N=V AND 15
300 Q=D(N):M=M+1
310 POKE C,Q
320 P=P-1:C=C+1
330 IF P>0 THEN 280
340 P=64:L=L-1:M=M+128
357 POKE C,13:C=C+1
358 PRINT "LINE";S:S=S+1
360 IF L>0 THEN 280
370 PRINT "LOAD RTTY BLANK TAPE"
380 PRINT "MAKE TAPE READY"
390 PRINT "HIT A KEY TO MAKE TAPE"
395 INPUT Z
397 AUDIO ON
400 DEF USR1=12336
410 B=USR1(0)
420 PRINT "ANOTHER COPY YES=1"
430 INPUT Z
440 IF Z=1 THEN 400
450 PRINT "REMOVE TAPE IT CAN BE"
460 PRINT "LOADED IN RTTYCW"
470 END

500 REM MACHINE LANG TAPE LOAD
510 DATA 134,52,183,255,3,142,1
520 DATA 218,159,126,189,167,1
530 DATA 13,124,38,249,174,141
540 DATA 0,165,141,12,76,39,8
550 DATA 150,124,129,255,39,2,32
560 DATA 243,57,159,126,189,167
570 DATA 1,38,1,57,134,255,151
580 DATA 124,57,141,37,15,120,79
590 DATA 52,64,189,166,92,53,64
600 DATA 134,255,151,111,174,141
610 DATA 0,120,166,128,172,141
620 DATA 0,116,36,5,189,162,130
630 DATA 32,243,189,164,55,15,111
640 DATA 57,48,141,0,80,141,61
650 DATA 142,1,210,134,32,175,132
660 DATA 198,8,111,141,0,79,141,33
670 DATA 129,13,39,9,167,128,108
680 DATA 141,0,67,90,38,241,93,38
690 DATA 8,166,141,0,57,183,1,209
700 DATA 57,134,32,167,128,90,38
710 DATA 249,32,239,173,159,160
720 DATA 0,39,250,141,1,57,52
730 DATA 4,32,11,141,5,129,4
740 DATA 38,250,57,52,4,166,128
750 DATA 173,159,160,2,53,132,10
760 DATA 13,70,73,76,69,32,78
770 DATA 65,77,69,32,63,4,4,64
780 DATA 0,96,0,106,170
800 REM CHARACTER PRINTED
810 REM DARKEST IS FIRST
820 DATA 35,35,35,37,37,37
830 DATA 33,33,43,43,34,34
840 DATA 46,32,32,32
900 REM PRINT SSTV PIX ROUTINE
910 L=42:P=64:M=16384
920 V=PEEK(M)
930 N=V AND 15
990 Q=D(N):M=M+1
1000 PRINT #-2,CHR$(Q);
1010 P=P-1
1020 IF P>0 THEN 920
1030 P=64:L=L-1:M=M+128
1040 PRINT #-2,CHR$(10);
1050 IF L>0 THEN 920
1060 END

```


SSTV Hardcopy Photos Made On TRS80C* Computer And Epson Printer



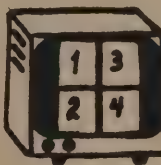
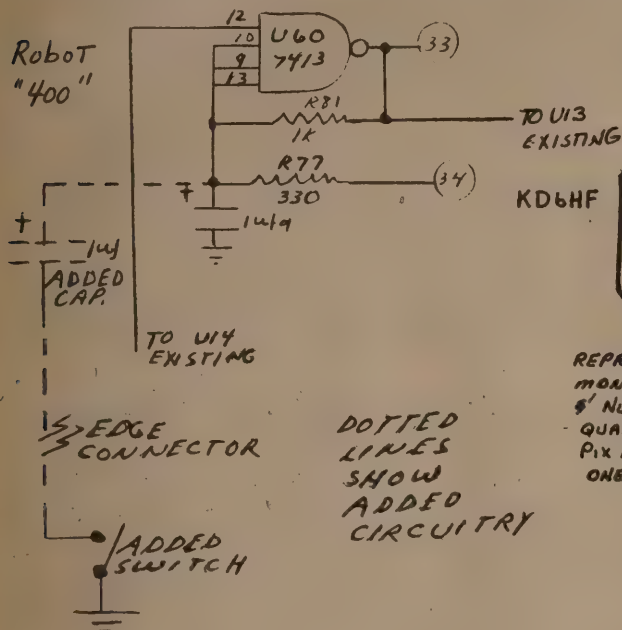
*TRS80C is a product of Radio Shack, Tandy Corp.

SSTV INTERFACE PC BOARDS FOR K6AEP SOFTWARE Designed especially for the TRS-80C*

A new series of PC boards for Clay Abram's TRS-80C software programs for CW/RTTY and SSTV is announced by Dynamic Specialties of San Jose, California. First available is the SSTV board system which features high linearity, noise rejection sync circuitry, 5-pole audio filter, 9-pole video filter & a tuning meter on receive. The transmitter utilizes modern state-of-art XR2206 for the function generator modulator and video mixing with the 7.3 software program. A unique source control switching network allows selection of external video, mix video, computer video, auxillary or tape and station microphone. 18 IC's, 3 transistors, 16 diodes and op amplifiers, all easy to obtain (replacement) are used on this quality silkscreened single PC board which is designed for minimal front and rear panel mounting. All power supply circuits are on the board requiring only 12vac current. Available April 82. Price range TBA. Write Dynamic Specialties, PO Box 20903, San Jose, California 95160.

ROBOT "QUAD-MOD" MOD

There is a simplification of the SSTV Quad-funtion of KD6HF's article on page 25 of the NOV/DEC 81 issue (Volume 11 #6) of A5 Magazine; I found that all that was required to lower the clock frequency of the U60 Schmitt trigger oscillator was to connect an additional 1 ufd capacitor to pins 10-9-13 of U60 and bring the ground end of the capacitor to the edge connector and on to a single pole switch on the front panel. Fig. 1 shows this simple hookup. The capacitor in the original oscillator should be nearly the same value as the one that you just added.



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Drop a note

Dusty Duan, W8CQ is the former editor of RTTY Journal and is not enjoying the best of health, according to the Journal. He would be happy to hear from amateurs, particularly the old-time RTTY'ers, so drop him a card at 1021 Marywood Drive, Royal Oak, MI 48067. — So. Counties Amateur Teleprinter Soc., CA

WORLD RADIO, February 1982

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-:- R T Y -:- SHOPPING FOR A TERMINAL UNIT

By Joe A. Elliott, K0WVN
607 Wabash St., Topeka, Ka 66616

First off, I hope that I have kept the language down to a level where anyone can understand so far. This usually is not a problem with me, but something could slip out! As it was said, in The First English Dictionary, compiled by Dr. Samuel Johnson in 1747: In promulgating your esoteric cogitations and articulating your superficial sentimentalities and amicable, philosophical and psychological observations, beware of platitudinous ponderosity. Eschew all conglomerations of flatulent garrulity. Dejeune babblement and asinine affectations. Let your extemporaneous decantings and unpremeditated expatiations have intelligibility and voracious vivacity without rhodomontade or phrasical bombast. Sedulously avoid all polysyllabic profundity, sittacious vacuity and ventriloqual vapidty. ---- In other words, speak plainly, briefly and purely, say what you mean, mean what you say and don't use big words!!!! Let me know if I do differently than just this!

In the past articles, I had mentioned that going **NOBULAR** would most likely be the smart way to go. Now, what I mean by modular is, you would have a machine or video, terminal unit, and any of a number of goodies available, separate from each other. Certainly, it is handy to have all in one unit, but very few have been completely satisfied with all the features. At least, if you go modular, you can replace the one thing you do not like with one that suits your needs or wants. When you get a unit, without shopping to see if it is what you want, it is too late then to say "**OVERS**". When buying, it will not hurt to be cautious and ask a lot of questions. It isn't much fun to rush over to another ham's home to tell of the wing ding fantastic gear you got, to find out he has something that attracts you more for less money. Suddenly, your news seems very insignificant, you realize that the gear will have to be used, at least enough to warrant the loss you have to take trying to re-sale it as "used". The plain fact is, it is much easier to sell small parts than large!

What questions do we ask? Well, this depends on a lot of things. Some questions will be the result of what you want to attach to the particular terminal unit. For instance, if you had bought a Radio Shack TRS-80 Color Computer, you are going to use Clay Abrams software for RTTY, you would certainly have to look for a TU (terminal unit) that offered RS232 I/O (input/output). Normally, this means it would have to be able to communicate with the computer using a minus 12 VDC being mark and a plus 12 VDC being space. This type of keying is most common among a variety of computers and is called **SERIAL** interfacing. If you were using a mechanical machine, you would then have to make sure the TU had a loop supply (usually 60 milliamperes). The most common shift is 170 hz shift being tones of 2125 hz and 2295 hz, this shift being most used on HF and VHF for amateur RTTY communications. If you are wanting to try a local two meter RTTY net, you certainly want to get AFSK (audio frequency shift keyer). Some will purchase a TU without an AFSK because they have FSK (frequency shift keying) built into their rigs and later find out they wish to go on two meters with RTTY, then having to purchase the AFSK to do so. Filters are most important, make sure the prospective TU has good mark/space filtering. If you like to build, there are still kits available and a good sign that you will be able to do most of your own trouble shooting and alignment when they are offered as such. Some TU's are critically tuned and will have to be sent back to the company that made it for alignment without precision test equipment available and tuning procedure information. While this sort of TU is fine when working, it would be a pain when something went sour. Even if you are not a builder and bought it wired, knowing it was offered as a kit means that some others can help in trouble shooting it locally. The term **AUTOSTART** most generally is a motor control circuit which will turn on a machine through an AC receptacle mounted on the rear of the TU when a signal is detected. It is not a circuit needing a certain sequence of designated code to turn on the machine, but rather turning it on as a result of detecting a valid mark or space. **NARK HOLD** is another good feature, not allowing a continuous space signal to run a machine open, but rather locking it in a standby until the signal is keyed. **REVERSE SHIFT** is not a feature that is used all the time, usually handy for telling those not aware that they are indeed up-side-down on the band. If you needed to reverse shift, you could select the USB when using AFSK, and advise them of the situation. **SCOPE OUTPUTS** are handy for those that might be able to grab onto a nice monitor scope, nice feature to have if you don't purchase one with a scope built in. **TTL COMPATIBLE** inputs and outputs is very handy for future desires and interfacing to some equipment, such as an APPLE II computer game board directly. Having more than one shift is not that necessary, only if you plan to try copying some ARMY/AIRFORCE MARS, commercial, or some die-hard two meter nets still using 850 hz shift. When looking around at the commercial broadcast, you will notice a variety of shifts and speeds being used. I had a fella try and break me on 20 meters using 425 hz shift and I switched shifts to answer him. He was not aware of what the amateurs were using on 20 meters, or what was the most common shift used. He had just gotten his toy and did not know anything about RTTY. With this information, he switched back to 170 hz shift and went on his merry way to have fun. **STANDBY/OPERATE** control is handy to have when using a machine and want to hold the machine from printing incoming print, or just to be able to type on the machine without anything coming from the receiver bothering local tinkering. **TUNING DEVICE** of some kind, whether it be a meter, scope, or bar graph, would be most handy indeed built into the unit. What speed do you wish to go, other than the normal 60 wpm? Some terminals will go no faster than 110 baud ASCII, some will go 300 baud ASCII, still keeping very good input filters, or several stages in each mark and space filter. In a lot of cases, where you have a TU that will go the faster baud rates, you sacrifice the band

width of the filter to pass the speed. However, you can still get good copy on the slower speeds even though there was some sacrifice. To go the faster rates than 300 baud, well, the only place this would be necessary would be for satellite communications, where you have maybe 20 minutes to QSO, or get said what you have to say by dumping a memory. Some like to run fast speeds on two meters, VHF and UHF will not be critical on filter requirements since you have no problems of QSB or QRM. However, if you decide to get something that runs faster than 300 baud, you might find it undesirable on the HF bands unless they switch in filtering for using it on HF. REMOTE CONTROL is one thing that is very nice, enabling you to remotely put the TU in transmit or receive, or have the TU put out a keying ground for PTT. INDICATORS are not necessary, but if you like flashing LED's, there are several attractive units available. Some will not truly indicate mark and space, they may indicate space in the absence of mark. A true condition is always best if you are going to pay for these indicators. If buying a kit, make sure you have the tools required to do the job, or what tools do they require to align. Single tone detectors, such as a PLL (phase lock loop) type TU is not desirable for HF, but they do well in fast communications for VHF and UHF. PLL type of TU's will realize a lot of garbled print due to the QSB and QRM on the HF bands. A TU that detects two tones is best in most situations that arise, such as fading, or marginal conditions. Operational amplifiers have proven to be very efficient in filter designs, much better than the torroids when it comes to copying in marginal conditions. They can be tuned very critically, space saving and the cost is low. You will see OP AMPS being used in just about all the terminal units available today, in one way or another.

So, what do we look for? You can look for the above features, don't be fooled by fancy ads when it comes to your RTTY pleasure. It is hard to get the schematics for all units available and even if you could, it would take a person very familiar with OP AMP designs to tell which is the better one to go with. There are even a lot of electrical engineers that are not very familiar with OP AMP designs. I was amazed to see one Bell Lab engineer question the application of an OP AMP filter with a non-Bell Lab engineer who showed him very quickly the answer on a black board. On these type of discussions, I stand back out of the way to see who convinces who, and if both agree on one thing, I take it as being the way it is! The exterior case really says nothing for what is inside, it is easy to get a large case, make it look good, then fill it with very little. Keep an ear out for problems others are having with various units, but keep in mind, some people blame their mistakes on the companies to keep from looking like a complete fool. We can ask, how good is the filtering compared to XYZ brand? Is there Autostart circuitry? Is there any problem with going 300 baud ASCII (for those thinking of computer communication rates)? How good is the reception in marginal conditions? How many shifts can the unit xmit and rec.? Does it have a good mark hold, not letting the machine run free if a space condition is received? Does it have scope outputs? What are the different types of I/O (TTL, RS232, FSK, nice to have)? Can it reverse shift, both xmit and receive (separate is nice)? Has the TU went through any outside lab testing? Is AFSK available and if so, is it xtal controlled with various shifts? Is there remote control features, such as remote PTT input and output? Do I have to pay for everything, or accept boards I do not care about at this time? Can I build it from kit form? Do I have to have special equipment to tune the unit if necessary? What kind of service can I expect if something goes wrong? Is there someone available to work with me on trouble shooting a problem? Is the unit on the shelf? How quick can you ship? SHIP IT!

You will find most companies very helpful in just about anything you are attempting to do. If there isn't anyone there to answer questions, most will give a call back to help you out.

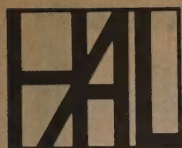
I might add, when it comes to metal cases for RFI being a subject of sales, all I can say is, if you are bothering a TU with RF from the xmitter, your shack is really in need of help. I have used TU's, bare board out in the open, with a linear and had no problem at all. It is nice to shield everything and use by-pass disc caps on all inputs and outputs to keep from having problems for some un-known reason. In other words, don't blame the company that makes the product for your own created problem, clean it up and be done with it.

There are a few TU's out on the market that does not have xtal controlled AFSK's. This is not a problem, if they are aligned while they are warmed up. When the TU reaches temperature, they should be very close to being on. Normally, this is a wait of about 15 minutes, where the xtal controlled AFSK is ready to go. Your rig needs good warming up anyway for stability, most turn their TU's on at the same time.

I hope this has opened a few eyes and shown you that it is not all that hard to get what you need along these lines. Shopping around can cost you time, but it could mean the difference in loving the gear, or looking for another sucker to take it off of your hands. Features cost money, the more you want, the more it cost. So, check around, compare, ask questions and hopefully, you will have made a good choice. Till next time - 73's - CUL AND BE GOOD! ::DE:: K0WVN:-:JOE:-:

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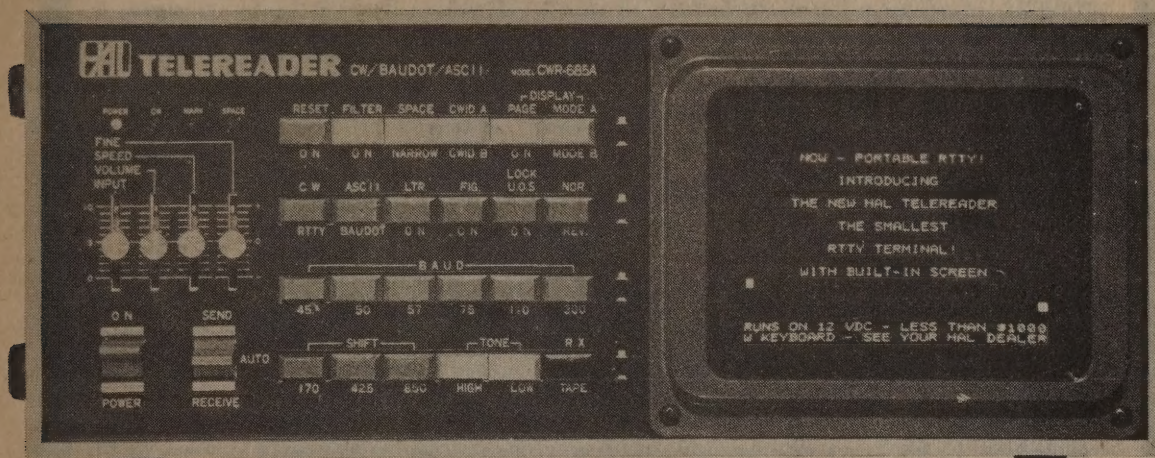


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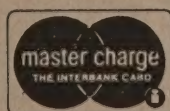
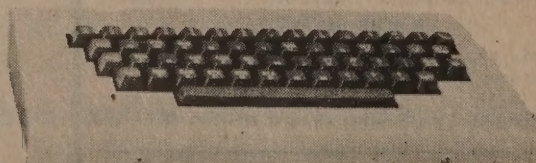
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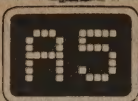


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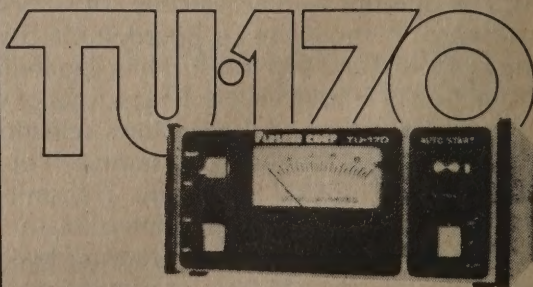
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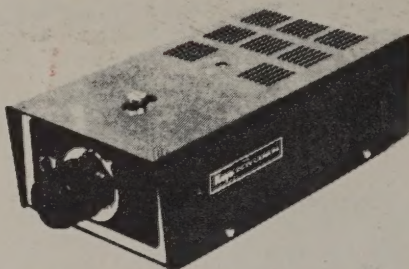
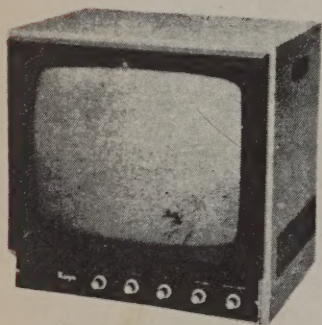
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